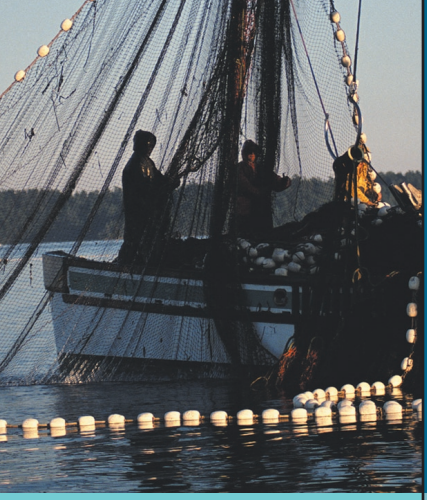

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Overview of Organic Markets: An Opportunity for Aquaculture Products?

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by

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This GLOBEFISH Research Programme covers the developments in the organic food sector in general and examines the potential for seafood products in particular. Organic seafood products are a sector which compared to other food products is still in its infancy. Organic aquaculture is described, covering standards, species, and products in the different producing countries. In this connection the possibilities and the major restraints are described. Ecolabelling based on sustainable capture fisheries is part of the analysis. The intention of the report is to assist producers in developing countries to take advantage of this niche market and be informed on basic requirements and trade channels in the dominant markets.

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EXECUTIVE SUMMARY

Consumer awareness about food production in general is growing and, as a result, the organic food sector is showing strong growth in markets in many developed countries, especially in the United States and in Europe. Most conventional retailers have now introduced organic products and many supermarket chains are creating in-house labels for their own lines of these products.

The organic sector responds to the needs of a group of generally well-educated and economically well-off consumers. The main motivation to buy organic food products is linked to health and environmental concerns, but life-style and quality aspects are also increasingly important drivers of consumers' choices.

Compared to other food products such as fruit and vegetables, organic aquaculture production is still in its infancy. Production is limited to a few species, mainly shrimp, salmon, trout and carp. These are produced primarily in Europe, South and Central America and in Asia. Products are usually offered in fresh or frozen form with very few value-added products yet on the market.

Currently, despite important growth rates, demand for organic seafood suffers from the absence of a harmonized set of production standards, which would ensure that the end product is recognized as organic in the retail market. A few national and private production standards have been developed but most cover only a few species.

Despite this, growing interest from consumers and retailers is having a positive impact on the development of the organic aquaculture sector. Conventional and, increasingly, specialized organic supermarkets are having a major impact on the market penetration of organic seafood, as they are able to reach a broader public and also to attract the occasional or new consumer of organic products.

The increased involvement of supermarkets in the sale of organic seafood will reinforce the trend towards sourcing directly from producers. This will allow price-premiums to be kept at a level which can be accepted by consumers, estimated at around 30 percent. Supermarket involvement and the entry of organic seafood into the conventional distribution channels for food products will also facilitate mass-market communication strategies highlighting its advantages.

In the future, convenience and functional[1] organic seafood will represent a growing niche in the organic food sector. This corresponds to the changing needs of consumers in developed countries coupled with increasing numbers of single households and working families. The shift in consumer age structure towards a higher percentage of older consumers with increased demand for healthy and low-fat proteins will also benefit organic seafood.

Bearing in mind that organic aquaculture will in any event remain a niche, it may nevertheless represent an economically and environmentally sustainable opportunity for a certain number of producers in developing countries, serving a high quality and value market segment. In many cases traditional production methods are already close to the standards required by certifying bodies, however reliable labelling as a communication vehicle for high and consistent quality is fundamental for the successful development of organic aquaculture. Thus the active participation of producers in developing countries in the further development of internationally accepted production regulations is very important.

[1] 'Foods that, by virtue of physiologically active components, provide benefits beyond basic nutrition and may prevent disease or promote health' as defined by the Director of the University of Illinois Foods for Health Program.

INTRODUCTION

Background

The present overview was prepared as a contribution to the first 'Organic Aquaculture & Sea Farming' Conference organized by INFOFISH/VASEP/FAO[2] in June 2004 in Vietnam. The attendance of more than 250 people from 38 countries affirmed the increasing interest in this issue from both consumers and producers.

Structure

In order to give a more comprehensive overview, the first chapter highlights the historic and current development of the organic sector as such, including a brief consumer profile. The second focuses on certification and labelling, which represents a particularly important issue in the sector. The main characteristics of the most important organic markets, in particular the United States, Europe and Japan, are summarized in the third section, without forgetting that organic markets are also becoming increasingly important in developing countries.

Chapter four is dedicated to organic aquaculture itself, with special attention given to the current production and certification status. The role of developing countries and of value added products in the context of organic production are also examined. The last part of the chapter deals with the major constraints for organic aquaculture.

Chapter five briefly introduces the issue of ecolabeling of wild fish. Although related to the capture fishery it reflects a similar trend to that for the organic sector.

The market overview for organic aquaculture products in chapter six is somewhat restricted by the lack of available information due to the current size of the market, but may be useful as an indicator.

Annex 1 gives detailed information on some existing organic aquaculture standards while annex 2 contains more detailed contact information on producers already involved in organic aquaculture production.

Methodology

This paper is based mainly on a literature review of available material on organic production and markets from different public and private sources. In addition, interviews with producers, certifiers and retailers were conducted during the BioFach Fair 2004 held in February in Germany, and at the European Seafood Exhibition held in May 2004 in Belgium..

With regard to organic aquaculture, a general lack of concrete information and some inconsistency in the available figures have emerged during the gathering of the data. This can most likely be attributed to the fact that there is still no internationally agreed definition of organic aquaculture.

1. THE ORGANIC SECTOR

1.1. DEFINITION OF 'ORGANIC'

Organic products are only those certified as being produced in compliance with strict organic cultivation methods. Therefore, by definition, organic products cannot be wild, but have to be farmed. 'Organic' doesn't have to be treated as equivalent to 'natural' or 'wild' even though terms like 'organic', 'biological', 'ecological' and 'green' are often considered to be synonymous. Product

[2] INFOFISH – Member organization of the FAO FISH INFOnetwork, VASEP - Vietnam Association of Seafood Exporters and Producers, FAO - Food & Agriculture Organization of the United Nations

labels indicating ‘controlled’, ‘integrated’ or ‘untreated’ products contribute to further confusion.
There are two predominating definitions of ‘organic agriculture’ at the international level. The first is provided by the FAO/WHO Codex Alimentarius Commission’s Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods (1999):

‘Organic agriculture is holistic production management systems which promote and enhance agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity...

Organic production systems are based on specific and precise standards of production which aim at achieving optimal agro-ecosystems which are socially, ecologically and economically sustainable. Terms such as "biological" and "ecological" are also used in an effort to describe the organic system more clearly. Requirements for organically produced foods differ from those for other agricultural products in that production procedures are an intrinsic part of the identification and labelling of, and claim for, such products’.

The second definition is given by the International Federation of Organic Agriculture Movements (IFOAM): ‘Organic agriculture is a whole system approach based upon a set of processes resulting in a sustainable ecosystem, safe food, good nutrition, animal welfare and social justice. Organic production therefore is more than a system of production that includes or excludes certain inputs.’

In both definitions, ‘organic’ refers primarily to the production process, which should use natural resources in a sustainable and proactive way. Organic agriculture refers not necessarily only to cultivation methods but can include livestock and fish farming systems. The objective of organic production is the enhancement of food quality and safety without compromising environmental needs and natural resources.

The ‘Clean’ Continuum – a conceptual spectrum of production systems

Wild harvest — CHEMICAL/INDUSTRIAL
Biodynamic
Organic
Chemical free
Reduced pesticide
Low input
Sustainable minimum till
Conventional
High input chemical intensive
BIOLOGICAL/NATURAL

Source: RIRDC, 2000

1.2. HISTORIC DEVELOPMENT OF THE ORGANIC MOVEMENT

The organic agriculture movement is the outcome of theory and practice since the early years of the 20th century, involving a variety of alternative methods of agricultural production, mainly in northern Europe. There have been three important phases:

- 1924-1970: In this first phase, producers themselves became increasingly interested in organic farming (‘Organic farming’, which originated in England on the basis of the theories developed by Albert Howard in his Agricultural Testament (1940); ‘Biodynamic agriculture movement’ led by Rudolf Steiner in Germany and ‘Biological agriculture’, which was developed in Switzerland by Hans-Peter Rusch and Hans Müller).
- 1970-1980: In the 1970s organic farming came to the fore in response to the emerging consumer awareness of environmental conservation issues. New associations were formed involving producers, consumers and others interested in ecology and a lifestyle more in tune

with nature. These organisations drew up their own specifications, together with rules governing production methods.

- 1980-1990: It was in the 1980s that organic farming really gained momentum, as the new production methodology continued to develop and consumers took more interest in its products, not only in most European countries, but also in the United States, Canada, Australia and Japan. There was a major increase in the number of producers, and new initiatives were introduced for processing and marketing organic products. This evolution, conducive to the development of organic farming, was very largely due to consumers' growing concern to be supplied with wholesome, environmentally friendly products. At the same time, public authorities were gradually recognising organic farming and including it among their research topics and adopting specific legislation.

Despite some differences of emphasis, the common feature of all the actors and movements involved in organic issues is to stress the essential link between farming and nature, and to promote respect for natural equilibrium. They distance themselves from the interventionist approach to farming, which maximises yields through the use of various kinds of synthetic products. Despite the vitality of these movements, organic farming remained undeveloped in Europe for many years.

	MAIN ACTOR	DISTRIBUTION CHANNELS	SUPPLY
1.Phase: 1924-1970	Producer	Direct marketing, consumer cooperatives	Supply > Demand
2.Phase: 1970-1980	Consumer	Direct marketing, consumer cooperatives, specialized health shops, first conventional supermarkets	Demand > Supply
3.Phase: 1980-1990	Governments	Supermarkets, direct marketing, specialized health shops, e-commerce	Supply > Demand

1.3. CURRENT SITUATION

Organic production is closely related to topics such as biodiversity, environment conservation and consumer protection and is becoming more and more popular as consumer awareness is growing – also due to the fact that health threats such as 'mad cow' disease and chicken flu are becoming increasingly common.

As stated during a workshop at the University of Wageningen[3], short-term profit is often incompatible with the long-term objective of sustainability. Producers must begin to give natural capital stock, that produces ecosystem services, adequate weight in the decision making process. As ecosystem services are far outside the market and uncertain, they are too often ignored or undervalued, leading to the error of designing breeding schemes whose social or ecological costs may outweigh their benefits.

According to G. Rundgren, President of the International Federation of Organic Agriculture Movements (IFOAM), '...organic is moving beyond the niche market into the mainstream...'. In a number of food sectors - most notably baby food - organic has already moved from niche to mainstream markets in many countries. The organic market is no longer in its pioneer phase but has entered an expansion phase which needs new target groups and marketing channels.

Organic agriculture is one of the most dynamic and rapidly-growing sectors of the global food industry. As stated by a recent IFOAM publication[4], the worldwide value of organic trade has doubled between 1998 and 2001, reaching an estimated US$ 23 billion in the year 2002. 95 percent of this value has been realized in developed countries. At present an average of 1.5 percent (20 million

[3] Olesen I., Gjerde B., Groen A.; 1999; *Methodology for deriving non-market trait values in animal breeding goals for sustainable production systems*, GIFT Workshop, University Wageningen
[4] Willer H., Yussefi M.; 2004, *The World of Organic Agriculture*, IFOAM

hectares in 2002) of all agricultural land is farmed organically. On the trade level, the share of organic products in the food market is about the same (a 1 to 2 percent share of global food and beverages sales).

According to a WTO/UNCTAD/ITC[5] forecast, the value of retail sales will reach between US$29 and US$31 billion in 2005. A study by UK based Organic Monitor shows that global turnover of organic food increased by 23 percent in 2001 alone. According to cautious estimates, experts expect an annual global growth of almost 18 percent by 2008.

Currently, organic products represent between 1 and 8 percent of total agricultural trade in developed countries and less than 0.5 percent in developing countries, even though the latter are supposed to have a comparative advantage since their traditional farming systems correspond to organic farming regulations.

It is not possible to make absolute statements about the production levels and potentials in organic farming, but a rough overview of how a conversion to organic agriculture will affect yields shows the following:

- In industrial agriculture (Western Europe, United States etc.) conversion to organic agriculture normally leads to lower yields, often in the range of 15 percent.
- In Green Revolution agriculture (irrigated lands in Asia or Mexico) conversion to organic agriculture leads to equal yields.
- In less developed agriculture (small farmers, traditional agriculture) organic farming leads to increased yields.

Amongst the benefits arising from organic production methods are safer working conditions (due to reduced use of pesticides/fertilizers), less food and water contamination, reduced runoff and erosion and enhanced bio-diversity.

Today's conventional agriculture system may give short-term gains in production, but in most cases it is not sustainable in the long term, nor does it guarantee safe food. In particular, conventional production methods are inadequate for disadvantaged farming communities and are thus not a suitable solution for many of those who face a food shortage.

Organic production has the potential to produce sufficient food of a high quality. In addition organic agriculture is particularly well suited for those rural communities that are currently most exposed to food shortages.

However at present, organic farming is concentrated mainly in the industrialized regions of the world, namely the European Union, the United States and Australia. According to the IFOAM study mentioned earlier, in 2002 the highest growth rate for organic products was observed in North America (12%).

European markets for these products are growing rapidly, with organic production now accounting for 4 percent of European Union (EU) agriculture. In most European countries however, market information on organic production, as a basis for investment and policy decisions,is currently seriously limited.

International trade statistics from the World Custom Organization, for example, do not yet classify organic products as an own commodity category, which results in their integration in the data on conventional products.

According to the Organic Trade Association's (OTA) Export Study on US Organic Products destined for Asia and Europe, 'the United States annually exports more than US$ 40 million in organic goods

[5] World Trade Organization, United Nations Conference on Trade and Development, International Trade Centre

to the United Kingdom and organic products worth an estimated US$ 40 - US$ 60 million to Japan. US organic exports to Europe are growing by approximately 15 percent a year, while exports to Japan have grown between 30 to 50 percent a year.'

An European Information System for Organic Markets (EISfOM) has been established with financial support from the European Commission and a first seminar will take place in Germany in 2004. The seminar will focus on the development, harmonisation and quality assurance of data collection and processing systems (DCPS) in the field of organic agriculture. The programme involves governmental and non-governmental experts and stakeholders from the 32 countries covered by EISfOM. Clear recognition and distinction is a prerequisite if organic products are to escape from niche product status.

Table 1. Estimated Retail Sales and Annual Growth Rates in the Organic Market

Market	Estimated Retail Sales 2003 in million US$	% of total food sales	Estimated Annual Growth Rate (%) 2003-2005
Germany	2 800-3 100	1.7-2.2	5-10
UK	1 550-1 750	1.5-2.0	10-15
Italy	1 250-1 400	1.0-1.5	5-15
France	1 200-1 300	1.0-1.5	5-10
Switzerland	725-775	3.2-3.7	5-15
Netherlands	425-475	1.0-1.5	5-10
Sweden	350-400	1.5-2.0	10-15
Denmark	325-375	2.2-2.4	0-5
Austria	325-375	2.0-2.5	5-10
Belgium	200-250	1.0-1.5	5-10
Ireland	4-50	<0.5	10-20
Other Europe	750-850	-	-
Total Europe	10 000-11 000	-	-
USA	11 000-13 000	2.0-2.5	15-20
Canada	850-1 000	1.5-2.0	15-20
Japan	350-450	<0.5	-
Oceania	75-100	<0.5	-
Total	23 000-25 000	-	-

Source: International Trade Centre, 12/2002, US$ 1 = Euro 1

During the past ten years, organic food has been one of the fastest growing segments of the international food sector, in terms of both land use and market size, reaching global growth rates of 10-12 percent annually. Some analysts predict a market increase of up to 25 percent by 2005.

The market share is estimated to reach a value between 5 and 10 percent of the whole food product market in the coming years. Obviously the high growths rates of this sector are also due to the fact that this market started up from almost zero. The growth rate will most probably peak sooner or later. Supply and demand will have to grow at the same pace in order to create a sustainable market for the future. Public campaigns have to focus both on production incentives and consumer information.

Individual national governments and industries have set demanding targets for the market share of organic products. In 2001 the German government declared its target to convert 20 percent of total agriculture areas to organic farmland in the next ten years. Canada's organic industry goal is a share of ten percent of the retail market by 2010.

Premiums for organic products are generally good, even when supply starts to approach demand, but must be balanced against conversion costs, certification costs, the usually higher cost of production and reduced yields. In general, throughout the world, it is felt that good organic producers are doing as well or better than conventional producers and are supplying a growing market, while markets for the equivalent conventional products are shrinking.

Western governments are paying greater attention towards this highly dynamic sector, while official institutions in developing countries rarely take it into consideration in their policies. In Germany, the Ministry of Consumer Protection, Food and Environment is emphasising its policy support for preventive consumer health protection and sustainable production methods. Several countries have already launched specific programmes to enhance national production and trade in organic goods.

The Government of the Netherlands supports organic production through a € 10 million campaign, including media advertisements, staff training, product information and promotion. Spain has prepared a € 56.6 million organic support programme and Brazil launched an Organic Act and a development programme called 'Pro-Organicos' in 2003. In 2004 the Czech Government approved an Organic Action Plan valid until 2010.

The Government of New Zealand agreed a development strategy for the organic sector, including a target of US$ 1 billion total sector sales by 2013. The British government aims to increase organic farmed land to at least 30 percent through its Action Plan on Organic Farming. The EU supports organic advertising and communication campaigns in UK and Italy with a provision of € 3.2 million for the period 2004-2006.

Promotion strategies supporting the increase of organic production that are implemented through these political measures usually consider growth in demand as an automatic consequence of growth in supply. The risk inherent in this one-sided approach is that it can generate oversupply which cannot then, at least in the immediate, be absorbed by the market. It is therefore very important that all market actors work together to benefit from the economies of scale. In addition, the involvement of all food shops is required in order to reach the broad mass of consumers.

Organic food is also increasingly accepted and requested by other non traditional client groups like (nursery) schools, company canteens, airlines (e.g. Swiss Air, Lufthansa, Delta Airlines) and the HRI (hotels, restaurants, institutions) sector in general. In Italy for example a call for tenders for school canteens has just been published, to provide organic and fair trade products for a total value of € 600 000 covering the period 2004 to 2007.

Organic products perform in different ways on different markets. Historically, fruit and vegetables have been the largest sub-sector in the organic food market. However the organic category is still relatively young and characterised by change. The growth in total organic sales has prompted a shift away from the traditional focus on food basics, such as fruits, vegetables, meats, dairy products and cereals.

Examples of expanding product lines include breads, biscuits, cereals, soft drinks, baby foods and prepared/chilled foods. As in the conventional food market, meeting consumer demand for convenience is increasingly a feature of organic food products, be it snacks or oven ready products. Suppliers are keen to maintain the high quality of new products in order to support the category as a whole.

The influence of multiple retailers and the entrance of established food manufacturers into organics mean that continued new product development is to be expected. Activity is likely to focus on convenience and luxury food items. This reflects both the upmarket profile of organic consumers and the increasing saturation of basic organic foodstuffs. The participation of major retail chains in the distribution network for organic products broadens the potential consumer base and allows development of economies of scale.

Organic non-food items like textiles and cosmetics are also becoming increasingly appreciated by producers and customers. One recent example is the organic cotton range of sportswear-giant Nike.

Organic Products from Developing Countries: Markets for Coffee and Tea

Some organic products like coffee and tea have a major importance for developing countries. Consumers in the 11 major EU member states consumed approximately 11 200 tonnes of certified organic coffee in 2001. Of these, 5 300 tonnes were certified as both fair trade and organic. Germany is Europe's largest market for 'sustainable' coffees followed by the Netherlands and UK.

In Europe, sustainable coffee accounts for 1.1 percent of total coffee sales. Market share is highest in Denmark (3.4 percent). More than 80 percent of organic coffee is sold through the retail sector. The remaining 20 percent is distributed through the catering sector.

The leading EU markets for organic tea are UK and Germany, with an annual consumption of 1 000-1 500 tonnes and 600-800 tonnes respectively. All other European countries consume a maximum of 100 tonnes of green or black organic tea per year. In Germany the bulk of organic tea is sold via organic shops or health food stores and Third World Shops, in UK it is sold through conventional retailers. More recently, however, organic tea has also been marketed via special teashops.

As far as the US market is concerned, developing countries are expected to have future market opportunities for the following organic products:

- products, mostly tropical, that are not produced in the United States (or only in very small quantities): examples include coffee, cocoa and tea, most tropical fruit and vegetables, various spices and herbs, dried fruit and nuts;
- off-season products, such as fresh fruit and vegetables, that are produced in the United States, but where there is an unmet demand during certain periods of the year;
- in-season products, e.g. fruit and vegetables, for which there is a temporary or more permanent shortage because of strong and increasing demand;
- novelty or specialty products, such as high quality organic wines, certain ethnic food products or retail-packed food products; this segment is currently of particular interest to European food exporters, though some developing countries might also profit from these opportunities, e.g. wine exporters in Argentina, Chile and South Africa.

1.4. CONSUMER PROFILE

Each generation evolves its own set of food choices - often influenced by cultural, social and economic circumstances. Given that natural foods are often considered 'niche', one might logically anticipate a single identity pattern for the typical natural consumer. Not so in this segment. The natural product experience reaches out to every age and income group. Geography and education play a role in this consumer's buying patterns, too.

As for what lies ahead in the natural/organic business, there appear to be many positive drivers. Validated by industry experts, media exposure and real consumer trends, this category is expected to enjoy continued expansion in the coming years.

Consumer factors that influence the organic category will intensify due to:

- An aging population
- Increased nutritional awareness
- Environmental issues
- Demands for convenience in foods, and in store locations

- A desire for good taste
- Dietary needs, i.e., food allergies, cholesterol concerns
- An increasing emphasis on prevention rather than cure
- The high cost of orthodox medicine
- Rising insurance costs

The growing attention and sensibility of consumers will be a major determinant in the development of the organic market segment all along the production chain. The image of the traditional 'green' organic consumer is no longer predominant. The purchasing decisions are influenced by psychological, social and economic factors.

Young and well educated people, older persons with medium-high level incomes and young families with small children are becoming increasingly interested in organic products, not only for health reasons but also for gourmet and lifestyle motives. Longevity, fitness, and disease prevention are important lifestyle goals for the natural consumer, particularly in the baby boomer and senior age groups. Marketing strategies should consider the multiple arguments for both targets: on the one hand, health and environmental issues, on the other, taste and trend aspects.

The same is true for producers, who have to offer fresh products as well as innovative value-added products (convenience food). Also, consumers require special offers, more promotion events (e.g. tasting campaigns) and more visibility, in form of advertisements. The 'new' organic consumer is mainly interested in the final product and its quality and not necessarily in a completely separated production and distribution chain.

The 'egoistic' aspect related to personal health benefits is the prevailing factor for this upcoming group of consumers. The current market for convinced organic consumers is mature and needs the introduction of new organic products. However, the 'switchers' are the economically more interesting target, to realize future increases in the organic market share.

In summary, in addition to the traditional organic consumer, a global organic consumer with the following characteristics, has been identified in an Organic Monitor study[6] and is emerging in all major organic markets:

- Lives in major urban areas;
- Aware of food/drink quality, origin and production methods;
- Belongs to the well-educated middle/high social class with medium/high income.

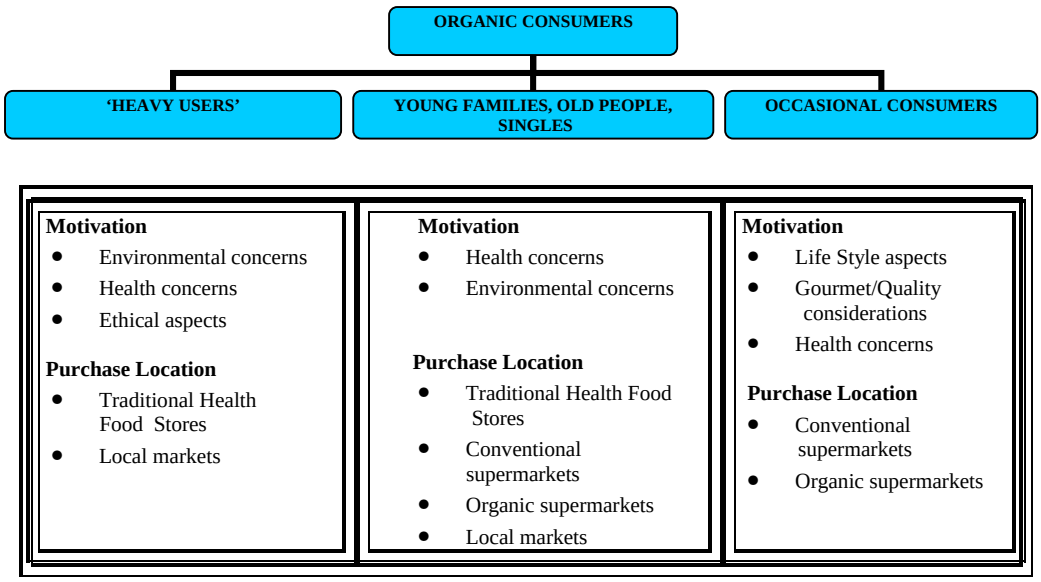
The growing importance of this new consumer is confirmed by the success of organic supermarkets, which represent an up-to-date way to buy alternative organic products without sacrificing the convenience of conventional supermarkets. There is a broad-based market of consumers that want tasty, healthy products with the convenience of their supermarket. These shoppers respond proactively to information about health issues and are willing to buy products they believe will improve their lifestyle. Educating and merchandising activities in this market will be the retailer's opportunity for success in a continuously dynamic sector.

The changes in consumption patterns are also accompanied by changes in Western societies. As noted earlier, with regard to age, the proportion of older people is increasing. This population group is particularly sensitive to health issues and might therefore be easily attracted by organic food.

Another change in society regards the ever growing share of female participation in the labour market as well as the rising number of single households. These consumers are usually interested in food

[6] Organic Monitor, 07/2003, *Global Market for Organic Food and Drink*

products that combine qualities such as easy and fast preparation, health merits and life style trends. They like to avoid effort and inconvenience in buying, preparing and consuming food and prefer 'one-stop-shop' solutions. Organic value-added convenience food distributed through supermarkets might be an answer to that need.



EU-funded research in the context of the Organic Marketing Initiatives and Rural Development (OMIaRD) project on 'The European Consumer', conducted in eight European countries, had some interesting outcomes. First of all, the study underlined the difference in consumer characteristics inside the EU. However, with regard to organic food, some common features emerged. All over Europe, health aspects are the primary motivation for choosing organic products. On the other hand, the higher price of these products remains the main constraint to its diffusion.

It is well known that a key challenge for organics is to increase the consumer base. A seemingly straightforward way of attracting more consumers is to reduce prices. Several consumer surveys affirm that a significant part of consumers would buy organic if products were less expensive.

The first 'Trade Panel' for organic products is expected to be activated in Germany in 2004. Based on the observation of consumption patterns by this panel, trade data at the retail level will be recorded in an appropriate database and available for further analysis in the future.

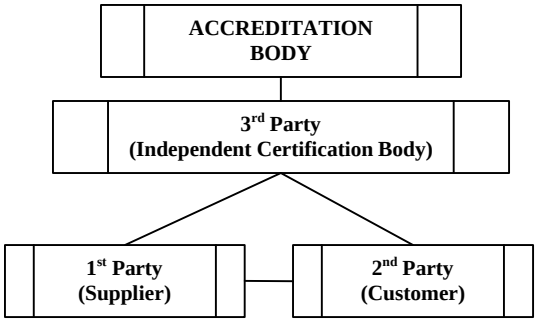
2. CERTIFICATION AND LABELLING

The terms certification, accreditation and traceability are often used in a rather inaccurate and generalized manner.

Certification is a process by which the conformity of products to applicable standards is determined and confirmed. The confirmation can be made by a First party (Supplier), Second party (Customer) or Third party (Independent body).

The term 'Certification' is normally only used for third party certification. Third party certification must be based on an independent system. Both products and services can be certified. Each type of certification must develop verification procedures relevant for what is certified and for the 'risks' involved in non-compliance.

Term	Definition
Accreditation	Procedure whereby an authorised body gives formal recognition that an organisation or person is authorised to carry out certain tasks.
Certification	Procedure whereby a third party (independent party) gives written notification that a product, process or service meets established requirements.



Organic agriculture is a production system, and organic products are those originating from such a system. Certification of organic agriculture is primarily certification of a production method. In order to satisfy market requirements the certification must also encompass the handling of products originating from such a production system.

The 'organic' quality of the product cannot be verified through product testing as in most other product related certification systems, however in some cases testing can be used to determine that a product is not produced according to the required standard (by showing substantial residues of a certain pesticide for example).

Traceability

The International Organization for Standardization (ISO) defines traceability as the 'ability to trace the history, application or location of an entity, by means of recorded identifications' and Codex has adopted this as their working definition for all Codex standards (Codex Alimentarius Commission, 2001). The 'Traceability of Fish Guidelines' were developed together with EAN (European Article Numbering) Member Organisations, the TraceFish project (a two-year project funded by the European Commission) and national working groups.

The adoption of the 'Traceability of Fish Guidelines' is voluntary. They define the minimum requirements for traceability of fish. These guidelines only apply to fish that have been farmed, caught from the wild and to products processed from such fish. However, they do not apply either to shellfish or to fish used as a raw material in the production of fish meal.

Normally certification of organic production is a 'three step' approach with certification of:

1. Producers - The producer and the fields and facilities used in the production.
2. Production system - The organic production method and processing methods. This includes the documentation and precautionary measures taken to maintain the integrity of the production system.
3. Products - The products finally labelled with the mark (logo, symbol) of the certification program.

ISO

The International Organization for Standardization (ISO) is a non-governmental organization established in 1947. ISO is a worldwide federation of national standards bodies from some 130 countries, one from each country. Its mission is to promote the development of standardization and related activities across the world in order to facilitate the international exchange of goods and services, and to develope cooperation in the spheres of intellectual, scientific, technological and economic activity.

There are a number of ISO guides, which concern the organic industry, covering accreditation, certification and inspection. The ISO Guide 65: 'General Requirements for bodies operating product certification systems' is a broad based document that addresses policies for any type of certification system. This guide is still the most influential for organic certification.

ISO 9000 is a set of standards for quality management systems that is accepted worldwide. To date more than 90 countries have adopted ISO 9000 as national standards. The standard intended for quality management system assessment and registration is ISO 9001. This applies uniformly to organizations of any size or description.

According to the Swedish consultants GROLINK[7], an organic certification system normally has the following elements:

- Standards:
  Standards should be clearly formulated and communicated to all participants in the certification system as well as being available for other interested parties. Standards must also comply with existing regulations both in the country of production and in the country where the product is marketed. One must keep in mind that standards will be upgraded continuously.
- Contracts and legal framework:
  All producers within a certification system should be bound by a written agreement with clear conditions, and consequences in case of violation. The certification system should be managed by a body with legal registration and ownership of its certification mark.
- Inspection:
  The inspection system must cover the full range of aspects such as agricultural production, transactions between participants, storage, processing, labelling and certificates).
- Certification, approval and handling of violations:
  Organic agriculture is a production system. The certification of producers and production are in many cases complicated and cannot be reduced to simple checklist procedures. This makes the element of decision making critical in the certification process. To have consistent procedures for handling of violations is also very important. Equally, in such cases, operators must have the right to appeal.
- Management:
  The certification program must work efficiently, and be able to administer not only the inspection and certification but also complaints and inquiries from outside parties.
- Labelling
  There must be clear regulations concerning labelling, the use of certificates and the certification mark. Also the program must monitor the market, to avoid any illegal use of its certification by producers not participating in the certification system.
- Information:
  Since certification of organic production is complex and the labelling of an organic product in itself does not provide the consumers with much information, the certification program should inform the public of the standards, inspection and certification procedures. Information directed to the operators (producers) within the certification system is also needed to ensure their proper understanding of standards, procedures etc.

[7] Grolink, 2000, *Guaranteeing the organic quality – Standards ,inspection, certification, accreditation and regulations*

In summary, certification is a procedure for verifying that a product conforms to certain standards. In the case of organic products, certification is primarily an acknowledgement that these products have been produced according to organic production standards.

To ensure that the certification bodies have the capacity to carry out certification programmes, they are evaluated and accredited by an authoritative body, the accreditor. So, accreditation status means that an authoritative body gives formal recognition that a certification body is competent to certify production activities. There is no international regulation on who may or may not carry out accreditation. However, several countries have designated official institutions for the accreditation of certification and inspection bodies.

IFOAM has established an International Accreditation Programme, which is operated by the International Organic Accreditation Service (IOAS). IOAS is an independent non-profit organization with IFOAM as sole member. IFOAM accreditation is based on compliance with its 'Basic Standards' and its 'Accreditation Criteria for Programmes Certifying Organic Agriculture and Processing'.

There is a need for product certification in order to enable importers and consumers to support ecologically sound production. The introduction and strict application of HACCP (Hazard Analysis of Critical Control Points) and a recognized EU-certificate are also crucial for exports to EU countries.

HACCP

The Hazard Analysis and Critical Control Points (HACCP) concept requires the written identification of potential risks in the production chain by the producer. These critical points have to be checked regularly by the producer, and documented, in order to avoid any quality or security shortcoming for the final product.

As stated earlier, health concerns are a main driving force in the consumer's decisional process for organic products. Therefore traceability becomes an indispensable key component for organic aquaculture products. In addition to brands, trustworthy quality labels assure consumers confidence in the food chain. In order to be accepted, the quality labels have to be transparent and provide additional detailed product information. Obviously, a future organic label will have to be constantly updated in order to reflect all the changes in consumer demand as well as scientific and technical developments.

The European Commission held a public hearing under the title 'European hearing on Organic Food and Farming – Towards a European Action Plan'. Negotiations on common EU regulations for organic fish farming are expected to be scheduled soon.

However, IFOAM, in collaboration with other institutions, acts as a leader in working towards the harmonization of national certification and standards. The International Task Force on Harmonization and Equivalence in Organic Agriculture, convened by FAO, IFOAM and UNCTAD in 2001, will serve as an open-ended platform for dialogue between public and private institutions (intergovernmental, governmental and civil society) involved in trade and regulatory activities in the organic agriculture sector. The objective is to facilitate international trade and the access of developing countries to international markets.

The Joint FAO/WHO Food Standards Programme, better known as 'Codex Alimentarius', provides a range of internationally adopted food standards with a similar purpose. The Codex is constantly updated and integrated in order to be as exhaustive as possible. In particular, the Codex Committee on Food Labelling developed the 'Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods', which were adopted by the Codex Alimentarius Commission in 1999. According to these guidelines, '...'Organic' is a labelling term that denotes products that have been produced in accordance with organic production standards and certified by a duly constituted certification body or authority. Organic agriculture is based on minimizing the use of external inputs, avoiding the use of synthetic fertilizers and pesticides. Organic agriculture practices cannot ensure that products are completely free of residues, due to general environmental pollution. However, methods

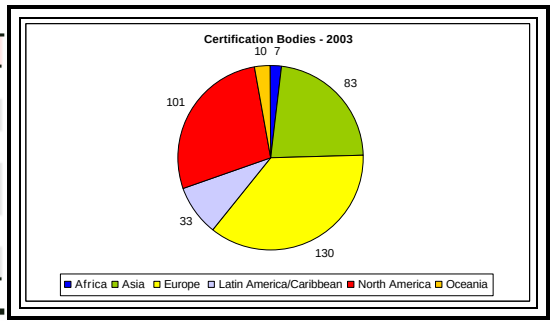
are used to minimize pollution of air, soil and water. Organic food handlers, processors and retailers adhere to standards to maintain the integrity of organic agriculture products. The primary goal of organic agriculture is to optimize the health and productivity of interdependent communities of soil life, plants, animals and people.'

The provisions for organic livestock and livestock products were only adopted in 2001. There are currently no specific standards referring to organic aquaculture.

Table 2/ Chart 1. Certification Bodies (2003)

Certification bodies and their approvals per region

Region	Total	IFOAM	Japan	ISO 65	EU	USA
Africa	7			1		
Asia	83	4	65	1	1	2
Europe	130	10	9	45	100	28
Latin America & Carribean	33	4		10	5	8
North America	101	4	1	14		64
Oceania	10	4	6	3	6	4
Sum	**364**	**26**	**81**	**74**	**112**	**106**



Source: GROLINK

2.1. ORGANIC CERTIFICATION

The following section offers an overview of some of the main bodies involved in certification and accreditation activities in the organic sector.

Accreditation Bodies

Accreditation bodies are active at international or national level.

- International Federation of Organic Agriculture Movements (IFOAM):
  The IFOAM Basic Standards provide a framework for certification bodies and standard-setting organizations worldwide to develop their own certification standards but cannot be used for certification on its own. Certification standards should take into account specific local conditions and provide more specific requirements than the IFOAM Basic Standards.
- International Organic Accreditation Service (IOAS):
  IOAS accredits certification bodies in compliance with IFOAM Basic Standards (IBS) and IFOAM Accreditation Criteria for certification bodies.
- European Accreditation (EA):
  The branches of European national accreditation bodies have been handled separately by EAC (European Accreditation of Certification) and EAL (European co-operation for Accreditation of Laboratories) concerned with certification bodies or with laboratories. These organisations have joined to form European Accreditation (EA) which now covers all European conformity assessment activities.
- International Accreditation Forum (IAF):
  The International Accreditation Forum Inc. (IAF) is the world association of Conformity Assessment Accreditation Bodies and other bodies interested in conformity assessment in the fields of management systems, products, services, personnel and other similar programmes of conformity assessment. IAF members accredit certification or registration bodies that issue certificates attesting that an organisation's management, products or personnel comply with a specified standard.
- United States Department of Agriculture (USDA):
  Accredits according to the National Organic Program (NOP)

- Ministry of Agriculture, Forestry and Fisheries, Japan (MAFF):
  Accredits according to the Japanese Agricultural Standard (JAS)

Label

EU:

The 'EU-Organic-Label' guarantees the production of food products according to the standards of the European Commission 2092/91. Council Regulation (EEC) No 2092/91 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs was adopted on 24 June 1991. It marked the culmination of the process of official recognition of organic farming in certain Member States and its intention is to clarify the concept of organic farming in the mind of the consumer, in particular by combating fraud, which was previously rife. The use of the European label is expected to become compulsory for member countries in the near future. As yet no standards for organic aquaculture are included in this regulation.

On 10 June 2004 the European Commission adopted the "European Action Plan for Organic Food and Farming" in an effort to facilitate the ongoing development of organic farming in the EU. The Plan sets out 21 policy measures aimed at improving information dissemination on organic farming, streamlining public support via rural development, improving production standards, and strengthening research.

Measures include an EU-wide organic label to simplify the myriad of existing national and private schemes. In an effort to facilitate third country compliance with the EU's organic standards, the Plan proposes to intensify efforts to include third countries in the equivalency list, thus raising the possibility of establishing a permanent Community list of inspection bodies recognised as equivalent for their activities in third countries not already on the list. Further measures to facilitate trade in organic products from developing countries will also be considered.

The Plan also calls for continued efforts to ensure that the definition of equivalence takes into account the different climatic and farming conditions and the stage of development of organic farming in each country. Regarding genetically modified organisms (GMOs), the Plan proposes to include provisions in the EU's GMO labelling regulations to explicitly exclude GM products from being labelled as organic, with a labelling threshold of 0.5 percent for products (other than seed) used in organic farming.

EU: Legal Instruments

The EU's principal legal instruments are Directives, Regulations and Decisions, each of which take precedence over national law. These all derive, some loosely, from clauses or general principles in the Treaty of Rome, the Single European Act, the Maastricht Treaty, the Treaty of Amsterdam and the various national Accession Treaties. In addition, the Court of Justice has created a body of case law. The choice of instrument, unless specified in a Treaty, is largely at the discretion of the Commission, which has the sole right to initiate Community legislation.

Directives have come to symbolise the new constitutional order of Europe even more than the other legal instruments such as Regulations and Decisions. At the summit of this order stands Community law, enshrined in the Treaty of Rome, as amended by subsequent Treaties. Directives are subordinate instruments, in that they must reflect Treaty provisions, but they are endowed with the same supremacy over national law. Unlike Regulations and Decisions, which, once issued, pass directly into effect throughout the EU, Directives have first to be enacted nationally before obtaining legal status. Thus member states have flexibility over the form of the legislation. Regulations and Decisions have direct effect, that is, they become law throughout the Union as soon as they have been issued.

Austria:

Bio Garantie is a certifier for organic products in Austria also providing standards for organic trout and carp farming.

Bio Ernte Austria is a private organic certifier who also covers organic aquaculture.

Belgium:

The state authority for organic farming is the Ministry of Agriculture. It recognises two inspection bodies: Blik and ECOCERTt[8].

Since the Biogarantie logo replaced former logos (Velt, Belbior) in 1987, the only logos for organic agriculture that are left in Belgium are Biogarantie and Nature & Progrès.

Denmark:

In Denmark, the state authorities control and supervise organic production and trade. Regulations are based on the EU legislation with the exception of fish farming. In order to strengthen consumer confidence, organic farms are inspected at least once a year and cross checking of supplier and customer accounts are undertaken to verify the conformity of the sector.

Finland:

The state label Luomu – Valvottua tuotantoa /Kontrollerad ekoproduktion (Certified Organic Production) is granted by the Plant Production Inspection Centre to operators whose products have been inspected by a Finnish inspection service. Up to February 2001, use of the Luomu Seal had been granted to 527 operators (farmers and processors) – mostly food processors, who have used the label on 2,400 products.

France:

Agriculture Biologique (AB) is one of the French quality and origin labels. It was introduced by the Ministry for Agriculture.

Germany:

Naturland: This association is involved in the certification of organic products all over the world and sets an example for other organizations.

'Bio-Label': This the official unified umbrella eco-label of the Ministry for Consumer Protection, Food and Agriculture for all organic produce. It was established in December 2001 and has been conferred to more than 20,000 products. However, aquaculture products are not yet covered. The legal basis for the label refers to the EU Organic Farming Regulation (No. 2092/91 and supplementary regulations).

There are currently more than 200 unofficial bio labels on the German market.

[8] See page 20

Naturland

Naturland - Association for Organic Agriculture was established in 1982 in Gräfelfing, near Munich, Germany. It has grown to become one of the most important organisations in the field of organic agriculture in the country. On the global level Naturland is one of the major certifying organisations for organic produce. The objective and mission of Naturland is the conservation of the environment and the maintenance of the natural basis of life by means of organic farming in all fields of agriculture. It is currently the largest certifier of organic seafood. It operates according to IFOAM guidelines and has been accredited by the United States Department of Agriculture. Since the development of the first organic aquaculture standards in 1995, about 50 seafood operations worldwide have obtained the Naturland label.

Greece:

The following certification and inspection bodies exist in Greece:

'DIO' was founded in 1993

'SOGE': was founded in 1985 and the inspection body with the same name in 1993

'Fysiologiki' ("The Natural One") was founded in 1994

Hungary:

Biokontroll is a non-profit organization established in 1996 and is acknowledged as an inspection and certification body by the EU and Switzerland. IFOAM accreditation is expected in February 2004. Accreditation to the NOP of the USDA has been requested.

Iceland:

The TÚN Certification Body, founded in 1994, commenced its own operations in 1996, having previously provided inspection and certification services through the Soil Association of UK (which also provided expert training).

The LÍV - Vistfræðistofan Certification Body, established in 1996, benefited from the expertise of KRAV from Sweden. It provides similar inspection and certification services to TÚN.

Ireland:

The Irish Organic Farmers' and Growers' Association (IOFGA) was founded in 1981.

Demeter Standards/ Bio-Dynamic Agriculture Association of Ireland (BDAAI) and Organic Trust Ltd. were both founded in 1991.

Italy:

Nine different bodies are currently certifying organic products in Italy. The Istituto di Certificazione Etica e Ambientale (ICEA) was founded by a group of associations involved in organic production. ICEA is accredited by IFOAM, the Japanese Ministry of Agriculture, USDA and the Conseil d'Accreditation du Quebec. It is responsible for controlling the compliance with the Associazione Italiana per l'Agricoltura Biologica (AIAB) organic aquaculture standards revised in December 2003.

Netherlands:

Skal is the inspection body for organic production in the Netherlands.

Norway:

Debio is a private organic certifier.

Portugal:

Sativa is one of the two private certification bodies for organic products in Portugal. The second one is SOCERT, a mixed capital association located in Peniche, whose French share belongs to ECOCERT (French Control and Certification Organization.

Spain:

In 1989, a national law specifying the criteria for the labelling of organic production was approved. The CRAE (Regulation Committee on Organic Agriculture; Consejo Regulador de la Agricultura) was established as the authority in charge of all matters related to organic agriculture. A state inspection system was introduced as well as the CRAE logo as identification for organic products. Some private trademarks like that of Vida Sana are used as recommendation logos for consumers.

Sweden:

KRAV is a private Swedish organic certifier that also covers Norwegian organic aquaculture production.

Switzerland:

Bio Suisse is a private organic certifier. Bio Suisse is the umbrella association for more than 30 organic farming organizations and about 6,200 Swiss organic farms (included 44 farms in Liechtenstein). A BioSuisse 'Bud'-labelled farm is entirely organically operated.

United Kingdom:

The Soil Association is a private organic certifier. It certifies about 80 percent of all organic products sold in UK (35,000 products) and is accredited by IFOAM and the USDA.

Australia:

The majority of organically certified Australian businesses are certified with ACO and their products carry the 'Bud' Logo. The standards also include organic aquaculture. ACO is linked to the Biologial Farmers of Australia Association (BFA).

Brazil:

The Associacão de Certificacão Instituto Biodinãmico initiated organic certification in Brazil and other Latin American countries in 1990. Its guidelines, internal control and certification programme

has been audited and approved by IFOAM, USDA/NOP and the German Accreditation Council (DAR).

Canada:

The internationally recognized Standards Council of Canada (SCC) manages the national accreditation and certification system according to ISO 65 guidelines. There are currently about 45 accredited national certification bodies operating according to technical standards which meet or exceed the Canadian National Standard for Organic Agriculture.

China:

The China National Accreditation Board issued its organic products production and processing guideline in August 2003.

Japan:

Since 2001, Japan has its own official organic standard, JAS.

New Zealand:

First formed in 1983, BIO-GRO New Zealand is the largest national private organic certification agency and organic producers and consumers organisation, certifying export and domestic producers according to the BIO-GRO Organic Production Standards. BIO-GRO is the only New Zealand certification body accredited by IFOAM. It also provides promotional, educational and technical support to its 1,200 members.

United States:

The US Department of Agriculture has put in place a set of national standards that food labelled as "organic" must meet, whether it is grown in the United States or imported from other countries. The USDA label is a four-category voluntary label. Products are either 100 percent organic, organic, made with organic ingredients, or containing some organic ingredients. The label ensures that customers receive what they think they are buying.

The USDA National Organic Program (NOP) issued a policy statement (May, 2002) stating that in the absence of national standards for organic aquaculture, certifying agents that have their own aquaculture standards and are accredited by USDA may certify aquaculture products as organic and use the USDA label. However as of 2004 the USDA has still not published its standards and, according to a Program Manager of the National Organic Program, aquatic animals can not be certified to the National Organic Program regulations and standards, or carry the USDA Organic Seal. An aquaculture task force is providing support to the development of such standards. Nevertheless, at the State level, Indiana (in 2001) and Iowa have introduced their own organic aquaculture standards

Three private organic aquaculture certifiers are operational: FOG, FVO and NOFA (Massachusetts)

International bodies:

In 1991 The Codex Alimentarius Commission (with the participation of observer organizations such as IFOAM and the EU) began elaborating Guidelines for the production, processing, labelling and marketing of organically produced food. In June 1999 plant production, and in July 2001 animal production quidelines were approved.. These Guidelines are in harmony with IFOAM Basic Standards and the EU Regulation for Organic Food (EU Regulations 2092/91 and 1804/99).

The International Federation of Organic Aquaculture Movement (IFOAM) is an international umbrella organisation for the organic sector.

ECOCERT is one of the leading international organic certification marks, providing inspection and certification according to European, Japanese and US regulations. It was founded in 1991 and its operational office is located in Germany. ECOCERT is accredited according to ISO Guide 65 (equal to EU norm EN 45011) by The Comité Français d'Accreditation (COFRAC), according to the NOP standard by the USDA and according to the Japanese JAS standard by MAFF.

The US company Scientific Certification Systems (SCS) was the first certifier to become accredited by the Marine Stewardship Council (MSC) and now offers its Marine Fisheries Conservation Program to recognize well-managed fisheries. Fisheries certified by the SCS program use the MSC logo for identification in the marketplace.

3. MARKETS AND TRADE CHANNELS IN THE ORGANIC SECTOR

The most important markets for organic food and drink products are the United States, Europe and Japan. In 2002, these markets were valued by the International Trade Centre (ITC) at US$ 11.75 billion, US$ 10.5 billion and US$ 0.35 billion respectively. Almost all organic products receive a higher price premium than conventional products. Currently this varies from 10 to 40 percent, even though poll data[9] affirms that consumers in general only accept a maximum of 20 percent. The higher prices are due to higher production costs. In fact, the profit margin remains basically similar to that for conventional products. However an ineffective marketing chain leads to bottlenecks in supply as well as in the range of products and keeps production and distribution costs - and subsequently also the retail prices - unnecessarily high. Examples of this inefficiency are small trade volumes and insufficient logistics. According to an FAO study prepared in 2003[10], organic products need a price premium varying between 0 percent for some traditional low-input products up to 124 percent in order to remain in the market. However, at the time of preparation of this study the average price premium was estimated between 14 percent and 53 percent.

The Rodale Institute in the United States launched the first-ever wholesale price index of certified organic foods in February 2003 known as The New Farm Organic Price Index (OPX). OPX tracks prices of selected grain, dairy and meat products that are organically grown or raised in the United States. The weekly updated price data is drawn from the best-available public and private sources and is freely available on the internet[11].

Increased supply and growing competition in the sector are likely to reduce the level of price premiums in the future. In order to increase demand for organic products, consumers must be better informed, organic products must become more visible and more easily available, the range of products has to increase, without becoming confusing, and quality and authenticity aspects have to be constantly highlighted.

'ORGANIC' in different languages	Italian: biologico
Spanish: ecológico	Dutch: biologisch
Danish: Økologisk	Portuguese: biológico
German: ökologisch, biologisch	Finnish: luonnonmukainen
English: organic	Swedish: ekologisk
French: biologique	Latin America: also "agro-ecológico"

[9] Oeko-Prüfzeichen GmbH, 2001, *Datensammlung zum Thema „Marketing für Oeko-Lebensmittel"*, www.oepz.de
[10] FAO, 2003, *Environmental and social standards, certification and labelling for cash crops*
[11] www.newfarm.org

Traditionally, organic food products have been sold outside the conventional distribution system through alternative channels, e.g. farm gate sales, open-air markets, specialized grocery shops and natural product retailers. Producers also offer their own products on the internet. Small and medium-sized companies, often located close to the relevant farming communities, have been involved in processing and manufacturing organic food products. Likewise, most packaging has been undertaken by small and medium-sized companies rather than by major food manufacturers. In order to guarantee an organic product to the consumer, not only the production itself but also the processing, packaging and distribution processes have to be monitored. The health concern has implications on the role of importers and suppliers who have to assure the traceability and quality of organic products during the passage from producer to consumer.

Nowadays, traditional specialized health food stores have to face increasing competition from the conventional retail sector. Due to strong market growth in recent years, sales have moved into the mainstream retail chains and the conventional food industry is becoming increasingly involved. Smaller companies still play a major role, but it is significant that more and more major food manufacturers and mainstream food marketers, including big multinational companies, are now developing and marketing organic product lines.

Actors in the conventional food retailing chains and processing companies are keen to develop the organic food market, as they realise that there is a growing consumer demand for these products and they are convinced that their efforts to increase supply will improve their competitiveness. The most important precondition for these pull strategies is a high level of market transparency – supported also by adequate product labelling.

It appears that with a more advanced and better organized organic market the importance of alternative channels, such as direct marketing and specialist organic shops, may decline and that of multiple retailers increase. Furthermore the organic food sector is undergoing a consolidation process through acquisitions, mergers and alliances. Consolidation is a common phenomenon in the organic market in order to create economies of scale and to broaden the supply base.

As noted above, distribution is no longer linked solely to the specialized health food stores but is entering the supermarket chains in Europe as well as in the United States. The involvement of large food retailers has a major influence on the increase of market share for organic products as they become available to more potential consumers and have lower distribution costs.

The ten largest conventional retail chains on the global level are Wal-Mart (United States), Carrefour (France), Ahold (Netherlands), Kroger (United States), Metro (Germany), Ito-Yokado (Japan), Target (United States), Tesco (UK), Costco (United States) and Safeway (United States). Their involvement in the organic sector will have a major impact on its development.

The Natural Marketing Institute, a US consulting, market research and business development company, has observed that there is a significant opportunity for retailers to help consumers simplify their shopping activities by providing one-stop shopping also for natural and wellness products.

The next growth phase for the natural products industry will largely be driven by consumer education. Experts believe that organic products are more competitive on the high end of the market, where added value and top quality justify higher price premiums. In order to remain in the market, highly competitive organic products have to keep a low price margin while seasonal and speciality organic products could realize larger price premiums.

Specialized health food shops have to stress their competence and attract new types of consumers if they are to survive in the long term. Networking with other actors, and the media, facilitates the visibility of organic products and can capture young people (e.g. information/tasting campaigns in association with gyms, participation of representatives of the organic market in talk shows, etc.).

The use of brands might also be helpful to attract consumers and to realize a clear USP (Unique Selling Point) in the market. Organic variants of major brands are being used to attract occasional or non-users of organic products. The responsibility for assuring high-quality sustainable products is somehow 'delegated' to the brands. The 'one-stop shopping' mentality becomes increasingly important for societies with more and more working women and a growing number of single households. This need for convenience is usually best satisfied by supermarkets that offer the whole range of products, from fresh produce to ready-to-eat preparations.

Another important factor regarding the distribution of organic products in supermarket is product placement. Some retailers present organic products in specific sections in order to satisfy the regular consumers. Others place them beneath the conventional products with the intention of upgrading the quality of the product. The certification of organic retailers is the missing link in the organic certification chain. Currently, an umbrella organization for organic retailers, the Organic Retailers Association (ORA), is being established with headquarter in Vienna, Austria. This Non Governmental Organization (NGO) should be registered by next summer.

3.1. UNITED STATES OF AMERICA

The US market for organic products represents half of total organic sales worldwide and has the highest growth rate. According to the Organic Trade Association (OTA), retail sales of organic products are expected to reach US$ 20 billion in 2005, which would mean an increase of 150 percent from 2000. Almost 2 percent of the food supply was provided by organic products in 2002. According to a recent OTA survey presented during the 'All Things Organic Conference and Trade Show' in Illinois, sales of organic products reached US$ 10.38 billion in 2003 with the share of organic meat, poultry and fish products in total organic sales at about 1 percent. These products constitute a new category in the organic food market and have still to develop their full potential. However, they showed the largest increase, growing by nearly 78 percent during 2003.

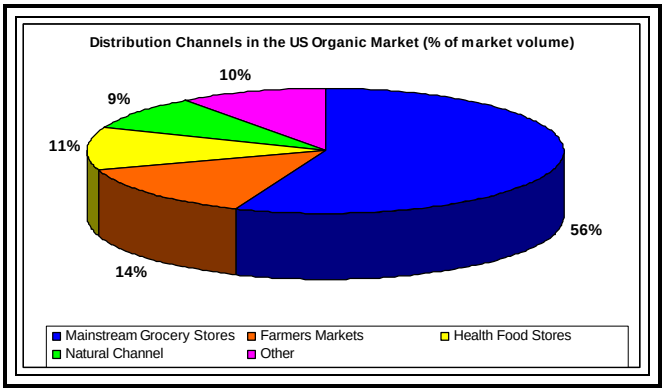
The USDA Economic Research Service[12] has analyzed that about 39 percent of the population – equal to more than 110 million people – purchase organic products and that demand is growing. The average per capita expenditure on organic products amounts to US$ 45 a year. Over the past ten years, the market for organic food showed double-digit growth rates of 15 to 20 percent every year, which is five times faster than the general growth rate for food sales.

The labelling requirements under the USDA organic standards apply to raw, fresh, and processed products that contain organic ingredients and are based on the percentage of organic ingredients in a product. Agricultural products labelled '100 percent organic' must contain (excluding water and salt) only organically produced ingredients. Products labelled 'organic' must consist of at least 95 percent organically produced ingredients. Products labelled 'made with organic ingredients' must contain at least 70 percent organic ingredients. Products with less than 70 percent organic ingredients cannot use the term organic anywhere on the principal display panel but may identify the specific ingredients that are organically produced on the ingredients statement on the information panel. The USDA organic seal—the words 'USDA organic' inside a circle—may only be used on agricultural products that are '100 percent organic' or 'organic'.

Many US manufacturers and distributors are specializing in processing and marketing organic products, while some long-time manufacturers of conventional products have introduced organic items in their product lines. As a result, an ever-widening array of organic agricultural and food products is now available. A study of the Rural Advancement Foundation International[13] (RAFI), published in 2003, analyzes the structure of the US organic market. Although organic foodstuff is sold through almost all types of food stores, by far the largest share of sales takes place through two major channels, natural product retailers and conventional supermarkets.

[12] Economic Research Service/USDA, 2002, *Recent Growth Patterns in the US Organic Food Market*
[13] Sligh M., Christman C.; 2003, *Who owns organic?*, Rural Advancement Foundation International

Chart 2. Distribution Channels in the US Organic Market



Source: Kortbech-Olesen, R., 03/2002, ITC

The natural food store sector has about 20 000 outlets in the United States focussing on the sale of organic and natural food products. While this sector does include some major chains, it still consists predominately of independent retail stores.

Already 73 percent of conventional supermarkets are offering organic products on their shelves. However, USDA does not have national statistics on organic retail sales. Industry sources have reported retail sales figures for organic food, but the data are fragmentary and, at times, inconsistent.

Table 3. Historical price premiums for organic grains and oilseeds in the United States 1995 – 2001 (Percentages)

	1995	1996	1997	1998	1999	2000	2001
CORN	35	43	73	88	98	89	59
SOYBEAN	114	85	141	202	217	175	177
SPRINGWHEAT	54	59	73	8	87	103	94
OATS	35	59	73	83	77	71	41

Source: Bertramsen and Dobbs, 2002

The major retail chain for organic products, Whole Food Market, Inc. based in Austin, Texas, sells a whole range of seafood products according to the USDC HACCP seafood safety program. Founded in 1980, it now has about 158 stores in North America and also in UK and a turnover of US$ 2.27 million in 2001 (US$ 1.84 million in 2000).

It offers a broad range of packed organic food and fresh organic produce. Its packaged range consists of well-known manufacturers' brands and private labels, including Whole Foods and its newly introduced Whole Kids Organic. Seafood products come from the supermarket-owned seafood facility 'Pigeon Cove'. It also has a processing facility, Select Fish, located on the West Coast. However In the absence of national regulations on organic aquaculture, Whole Food Market refuses to trade in seafood products labelled as organic and offers only sustainable wild fish with eco-labels such as MSC.

The second most important chain for organic products in the United States is Trader Joe's with almost 200 stores. It offers some frozen seafood which is prepared without additional chemicals.

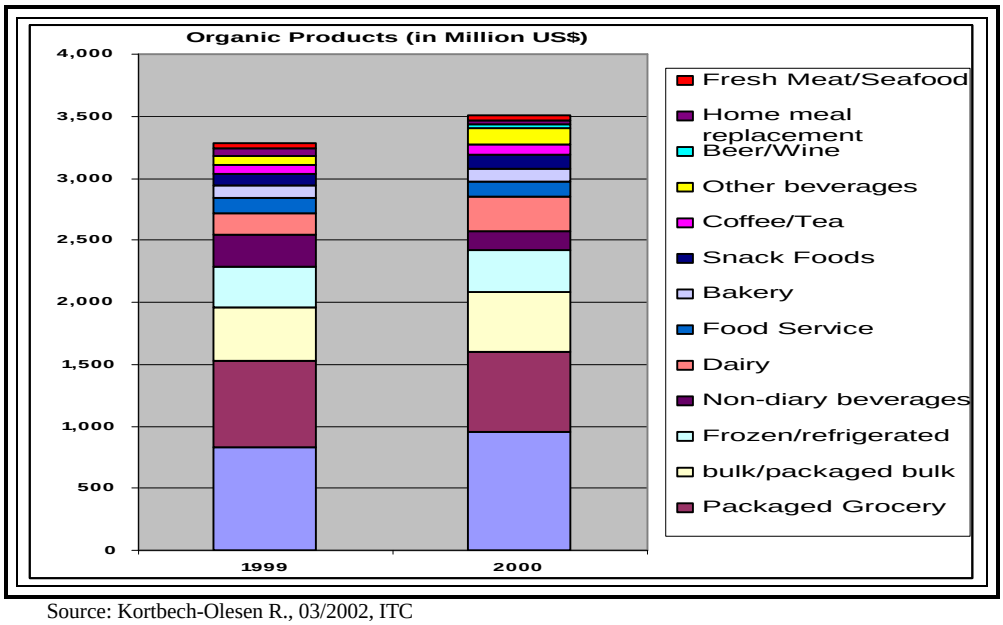
Wild Oats Markets, Inc., based in Boulder, Colorado, is the third major nationwide chain of natural and organic markets with over 110 stores in 23 states and in British Columbia, Canada. It had annual sales of US$ 838 million in 2000.

The US$ 4.5 billion sales figures for 2000 (US$ 3.9 billion) of the Natural Foods Merchandiser's (NFM) annual Market Overview from June 2001 included organic food and beverages sales of about US$ 3.6 billion (US$ 3.2 billion) and organic supplement sales of about US$ 0.7 billion (US$ 0.7 billion). Figures shown in brackets are for 1999.

Food and beverage sales for the year 2000 can be further broken down, by product group, as follows with figures for 1999 in brackets:

Fresh produce (fruit and vegetables): US$ 953 million (US$ 833 million), packaged groceries: US$ 652 million (US$ 692 million), bulk/packaged: US$ 482 million (US$ 437 million), frozen/refrigerated: US$ 333 million (US$ 323 million), non-dairy beverages (soy, rice, oat): US$ 262 million (US$ 157 million), dairy: US$ 273 million (US$ 171 million), food service (deli, restaurant, juice bar): US$ 120 million (US$ 127 million), bakery: US$ 110 million (US$ 98 million), snack foods: US$ 105 million (US$ 89 million), coffee/tea: US$ 86 million (US$ 78 million), other beverages, excl. beer/wine: US$ 133 (US$ 68 million), home meal replacement: US$ 32 million (US$ 58 million), fresh meat/seafood: US$ 44 million (US$ 35 million) and beer/wine: US$ 27 million (US$ 6 million).

Chart 3. Organic Product Groups by Value (US market)



Source: Kortbech-Olesen R., 03/2002, ITC

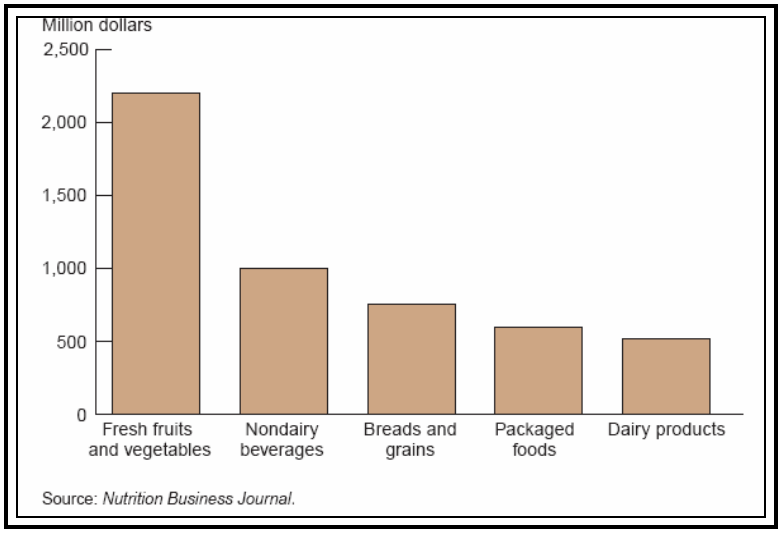
According to the USDA[14], fresh fruit and vegetables are still the most important product group in terms of retail sales of organic foods (accounting for over 40 percent of the total in 2000) and also amongst the biggest imports. It includes tropical fruit and vegetables all year round, e.g. banana, pineapple, papaya and mango, off-season items as well as in-season items, which happen to be in short supply from time to time.

[14] USDA Economic Research Service, 2002, *Recent Growths Patterns in the United States Organic Foods Market*

American organic food manufacturers offer an almost complete range of processed foods, including baby food, cereal products, preserves, canned and jarred items, dried and frozen food, ready meals and other convenience foods. The United States imports increasing amounts of some of these products.

The chart below illustrates in a more detailed way the top five organic products in terms of values sold in the United States in 2000.

Chart 4. Sales Value of Organic Products in the United States for the year 2000



The organic consumer is expected to accept price premiums of 10-20 percent. If higher than that he/she is usually more reluctant to buy organic products. Developing country exporters may also typically expect a premium of 10-25 percent, though in some cases the premium may be much higher, up to a hundred percent or more, if the product concerned is in short supply. However, the usual supply/demand mechanism will tend to force prices down over time.

With their growing success, organic companies are becoming more and more interesting for the major conventional producers. The US organic market is currently dominated by takeovers of organic producers by market leaders wanting to participate in the business.

At present, the distribution of organic products still passes mainly through specialized wholesalers. United Natural Foods (UNF) and Tree of Life are, together, responsible for the distribution of 80 percent of all organic products in the United States. These are delivered to organic food stores as well as to conventional supermarkets

Tree of Life, Inc. was founded in 1972 as a natural food wholesaler evolving from its roots as retailer in 1970. Since then, Tree of Life has established itself as a leading premier distributor of natural, specialty, and organic foods in the United States and Canada. With distribution facilities all across the United States, more than 6,000 employees, and an inventory of over 100,000 products, Tree of Life, Inc. is the world's leading marketer and distributor of natural and specialty foods, serving more than 20,000 retail customers.

United Natural Foods (UNF) is another leading independent national distributor of natural foods and related products in the United States, including nutritional supplements and personal care items,

In addition to the above companies, there are a number of other wholesalers and organic manufactures/packers playing a similar role in marketing and distribution of organic food, including the following:

- Eden Foods operates as an organic manufacturer and wholesaler, supplying a wide range of retail-packed organic products under the Eden brand, packaged by the company itself or by its business partners, and it works directly with organic farmers. Eden Foods is also an importer.

- Frontier Natural Products Co-op is a member-owned cooperative bringing together retailer, distributors, manufacturers, buying clubs and organizations. It specializes in herbs, spices and related products and supplies bulk as well as retail and foodservice packs.

Important manufacturers of organic food in the United States are General Mills, through Small Planet Food and Cascadian Farm, the Hain Celestial Group, Horizon Organic Holding Cooperation and Seeds of Change.

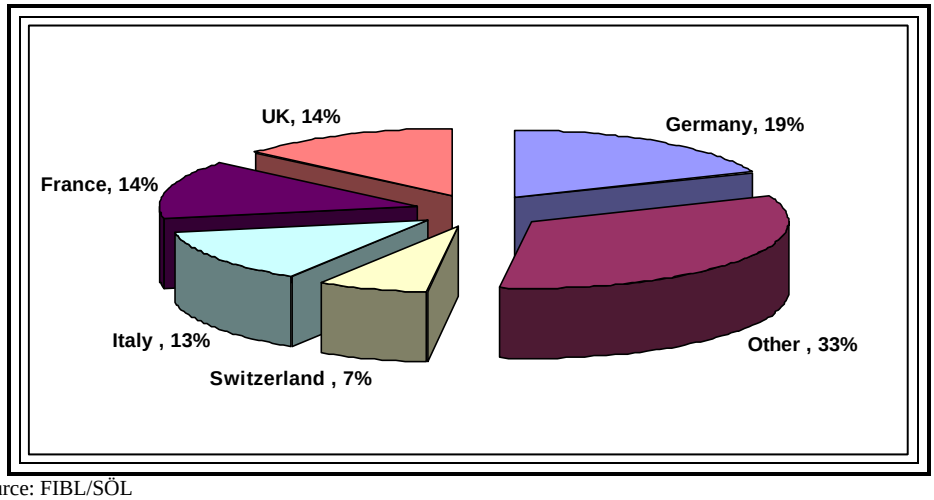
The long-awaited National Organic Standards, published by the USDA in early 2001, gave added momentum to the organic market. These new standards provide consistent criteria nationwide. They also detail the methods, practices and substances that can be used in producing and handling organic crops and livestock, as well as processed products, and provides guidelines for package labelling. However, as stated earlier organic aquaculture standards are not yet included.

3.2. EUROPE

According to IFOAM, the European market for organic products was valued at almost US$ 10.5 billion in 2002. While total food sales in the EU are stagnating, sales of organic products are rising. The British market analyst Datamonitor predicts an increase in the European organic market to € 15.1 billion by 2007.

The chart below illustrated the distribution of the value of the European organic market in 2002.

Chart 5. Estimated Share of Retail Sales in Europe in 2002

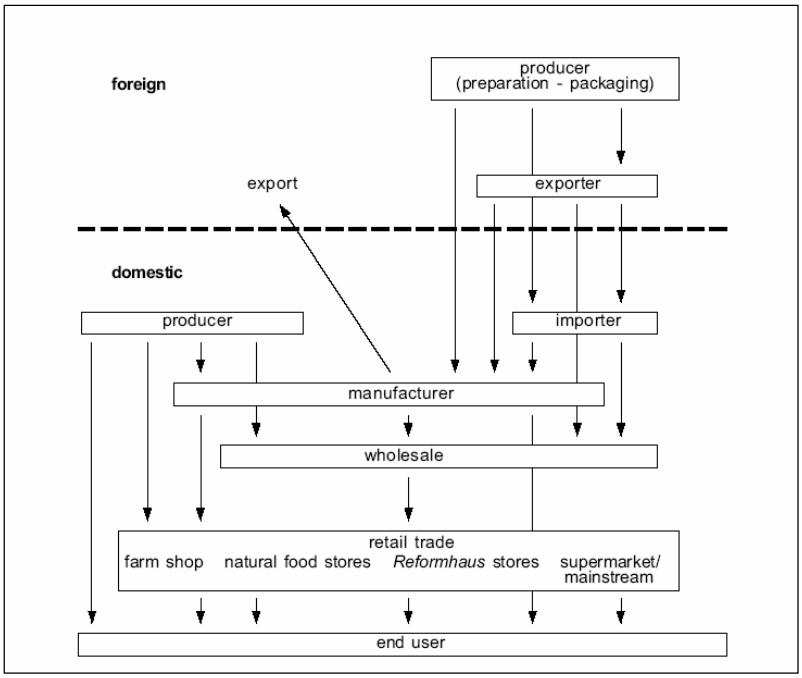


Source: FIBL/SÖL

Foreign producers and exporters supply their organic products to importers in the EU. Distribution through a specialised importer and/or a processor/packer is the most usual form. In each market and for each of the major product groups a few specialised traders tend to be the main customers for foreign exporters. They import on their own account and sell to packers, processors and food manufacturers.

By using direct marketing methods, farmers take greater control of their sales. They bypass traditional channels and supply directly to consumers at the local and regional level.

Organic foods that do not require much processing before consumption like fruits and vegetables are ideal for one-on-one marketing. Direct marketing methods include use of farmers' markets and box schemes (weekly or fortnightly home delivery of boxes containing a selection of organic products). Direct sales from foreign exporters to the central purchasing units of retail chain storesare still rare, but are likely to become of growing interest to retailers as volumes and uptake of new organic products increase.

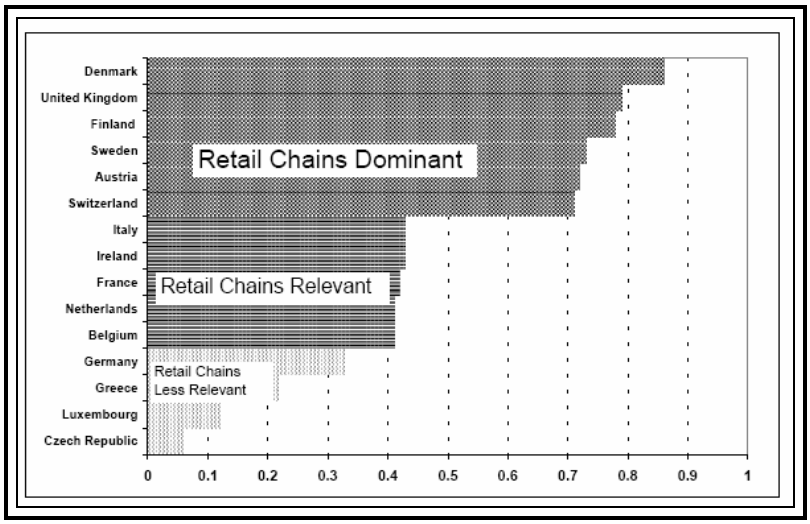


Source: J.Pierrot, CBI

Health food stores (also called 'Reform shops') market products which are – or are perceived to be - healthy. Leading products supplied by these shops are food supplements and natural medicine products. Natural food stores predominantly offer organic products in their range. These stores profile themselves with organic products and the assortment commonly consists of fresh produce.

There are exceptions such as whole-food stores in the United Kingdom, of which only a small share of their range consists of fresh produce. A study by Datamonitor estimates that demand for organic ready meals will increase at an annual compound growth rate of almost 17 percent by 2007.

Chart 6. Share of organic products' value sold through retail chains in European countries in 2000



Source: J. Pierrot, CBI

According to the Centre for Import Promotion from Developing Countries[15] (CBI), Germany is the most important market for organic products in Europe in terms of quantity, but UK shows the highest growth rate. The French market is the third largest. Some emerging markets such as Belgium, Greece, Ireland and Spain are expected to become more important in the future.

[15] Under the jurisdiction of the Dutch Ministry for Foreign Affairs

The most important wholesaler for organic products in Europe is Distriborg, a subsidiary of the Dutch food group Koninklijke Wessanen. It distributes to supermarkets and health foods shops throughout Europe such as La Vie Claire, a franchise chain of organic foods shops in France, and various other specialty stores. Distriborg also has its own brands, such as Vivis, Equilibrance, and Bjorg.

DISTRIBORG GROUPE
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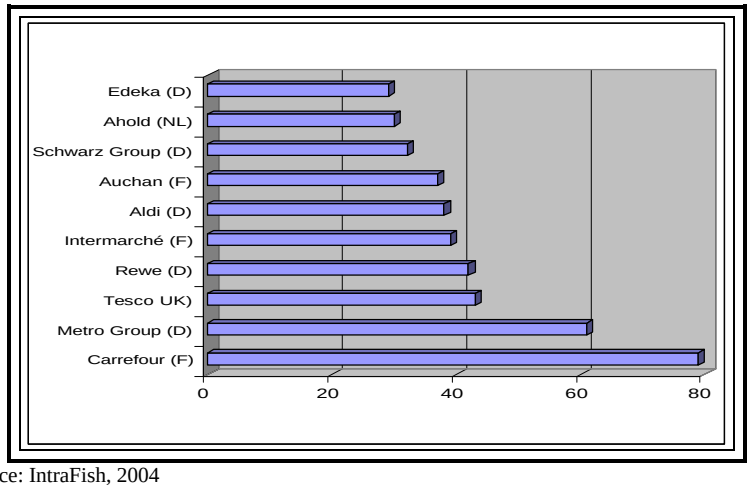
Table 4. Organic retailing in Europe in 2000

Country	Specialized shops	Conventional food stores	Direct sales	Others
Spain	85%	10%	3%	2%
Netherlands	44%	41%	10%	5%
Greece	40%	22%	18%	21%
Belgium	40%	50%	10%	0%
Italy	39%	43%	11%	7%
Germany	38%	33%	17%	12%
France	28%	42%	23%	7%
Switzerland	19%	71%	7%	3%
Austria	8%	72%	15%	5%
UK	8%	80%	12%	0%
Denmark	4%	86%	7%	3%
Sweden	0%	73%	5%	21%
Average	**29%**	**52%**	**12%**	**7%**

Source: M. Joensen

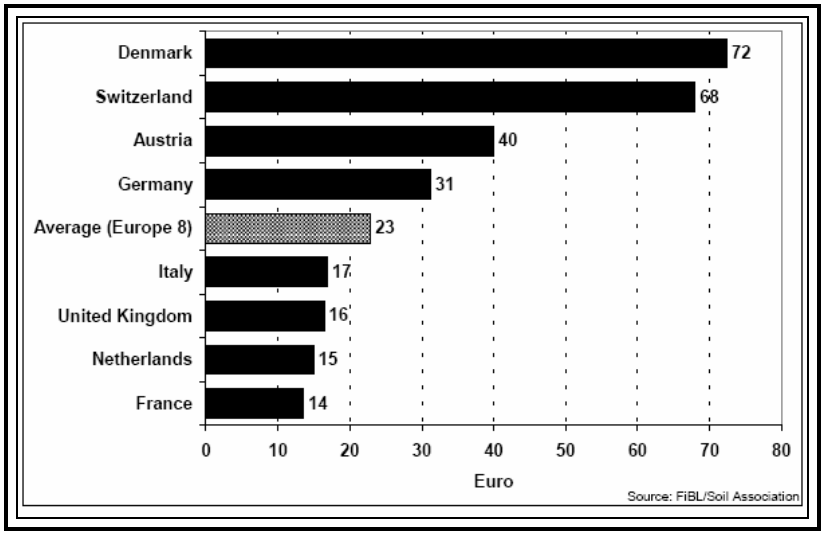
According to IntraFish, the main conventional food retail chains in Europe are Carrefour, Metro, Tesco, Rewe, Intermarché, Auchan, Schwarz, Tengelmann, Aldi, Edeka, Ahold, Opéra, Sainsbury, Leclerc, Wal-Mart, Safeway, Marks & Spencer, Iceland, El Corte Ingles and Migros.

Chart 7. Europe's Largest Retailers by Sales Volume (in billion Euro)



Source: IntraFish, 2004

Chart 8. Average per capita expenditure for organic products in selected countries in 2000.



Source: FIBL/Soil Association

Austria

According to a USDA report[16] sales of organic products amounted to US$ 188 million in 2002, with organic food products representing a share of about 3 percent of the food market. This is expected to reach 4 percent in 2004. The import value of organic products is about US$ 68 million (about 30 percent of the organic products consumed). The main external suppliers are the Netherlands, Germany, France and Italy. Supermarkets usually import directly from producers, or purchase from conventional wholesalers under contract, or from specialized importers of organic products.

Specialized health food stores are usually supplied by specialized importers or wholesalers. These specialized traders are mostly subsidiaries of German importers/wholesalers or operate directly from Germany. However the Austrian market is now largely dominated by supermarkets offering organic products under their own labels. The USDA report confirms that more than 70 percent of total organic sales are made in food retail stores, 18 percent come from direct sales, farms and restaurants and that the health food stores account for 9 percent. Austria's biggest supermarket chain Billa / Merkur launched the organic food brand "Ja! Natürlich" ("Yes! naturally") in 1994. Now, all major conventional supermarket chains, including discount chains such as Adeg, M-Preis, Maximarkt and Spar ("Natur pur" dairy products) have started to offer organic products. The intensive marketing of organic brand names by the individual food chains has caused consumer demand to increase.

However, not all producers of organic products are happy with distribution through conventional food chains and the development of intermediate marketing strategies between the two extremes of direct farm sales and supermarkets is an important option. Representatives of the association Ernte-Verband consider the expansion of regional distribution channels to be a desirable long-term goal. At present, more than ten representatives of the provincial associations are working on developing regional distribution and marketing strategies. Organic farmers' co-operatives are another way to market organic products. Several provinces and associations affiliated with the umbrella organisations ARGE Bio-Landbau and OeIG have created co-operative ventures between organic farmers and canteens in the public and private sector, e.g. hospitals and nursing homes. Home delivery services and organic shops have been established, especially around big cities. Organic markets can be found both in cities and villages. Farm shops, the most direct form of marketing, can be found in every Austrian region. Some farm shops offer a range of Austrian and international organic products, such as 'fair trade' coffee and chocolate, in addition to their own products.

[16] USDA Foreign Agriculture Service, 2003, *Gain Report Number AU3008*

Belgium[17]
The total organic market was worth about € 160 million in 2002 and trade in organic products is growing faster than national organic production. The traditional marketing channels for organic products were natural food shops, weekly markets and direct farm sales. Marketing organic food through supermarkets (S.A. Delhaize, the GIB-group, S.A. Colruyt) gained importance during the 1990s and supermarkets now control half the market. No statistical data on processing and marketing of organic products or on their development is available at the moment. Only a few initiatives have come from organic farmers themselves who still primarily use their own regional marketing channels. Most organic products are produced within conventional production units, as the number of farms producing only organic products is very small.

Denmark
The Danish market for organic products is one of the most mature in Europe. Government and stakeholder associations started advocating organic products many years ago and consumers are already well informed and involved. According to a survey by CBI[18], the value of organic products traded in Denmark amounted to € 445 million in 2001. Overall market share increased to 5.6 percent in 2003. The integration of organic products in conventional Danish supermarkets is a broadly affirmed phenomenon due to the low presence of specialized organic retailers. In fact, about 85 percent of total organic sales are made by the conventional retail food trade.

COOP Denmark, one of the major Danish retail conglomerates and a part of COOP Norden, has focused on organic products as part of its core strategy. Its organic market share now lies at around 5 percent of its total food sales. In 1993 COOP reduced prices on organic products, resulting in a substantial increase in demand. The reduction in prices and aggressive promotion in the media have had a substantial impact over the years. However the annual growth has slowed down since 2001.

Approximately 94 percent of Danish consumers are familiar with the national organic 'Ø'-label. Intensive marketing has created awareness and established great confidence in the Danish label. A study shows that 85 percent of the consumers do not trust foreign organic products without the Ø-label. The more distant the product is, the less confidence the consumers have. In Denmark, every company involved in processing, packaging or importing of organic foods must notify the public authorities. This requirement aims to keep organic products separate from non-organic during the whole production chain. When a product is sold as 'organic', controls must be made to verify that any processing, wrapping and packaging comply with standards and regulations for organic products and that there is no contact with non-organic products. . ..

Finland[19]
In December 2000 there were about 596 registered food processors covered by different certification systems. In 1999, 41 percent of the certified processors were bakeries, 27 percent were farms processing mainly their own organic produce, 9 percent were processors of animal products, 8 percent mills and 15 percent other processors, packers and importers.

During the 1980s, farm gate sales and local markets were the main marketing channels for organic potatoes and vegetables. Cereals were marketed through traders specialised in organic products, local mills and small bakeries. Production of organic animal products was almost non-existent before the 1990s and the pioneers usually started marketing their products by direct sales. Attempts to establish specialised organic food stores have not been successful in Finland, and even today only the largest cities have one or two organic food stores, although smaller towns do have outlets especially in market halls. Most attempts to sell domestic organic produce to supermarkets in the late 1980s failed ue to inadequate supplies. Therefore the most common organic items in supermarkets were of foreign origin.

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[17] Heuschen C., Geels Jerome, 2001,*Organic Farming in Belgium 2001,* www.organic-europe.net
[18] Pierrot J., 10/2003, *EU Market Survey: Organic Food Products,* Centre for the Promotion of Imports from Developing Countries (CBI)
[19] Sampsa Heinonen, 2002, *Organic Farming in Finland 2002,* www.organic-europe.net

It was only the rise in organic agriculture during the 1990s that allowed the development of an organised market structure. About half of organic products are now marketed through conventional supermarkets, 20 percent through farmers' markets or market halls, 18 percent through farm outlets and seven percent through specialised shops. Assuming that the total market share of organic production was 1.5 percent, the value of Finnish organic production would have been around € 150 million in 1999.

France

As reported in the CBI study referred to earlier, the French market for organic products is the third largest in Europe and has still to grow, with a sales value of € 800-850 million in 2000 and supply not covering demand. According to IFOAM, the French organic market was valued at € 1.3 billion in 2002. By 2007, it should reach around € 1.9 billion if the estimated growth rate of 8.6 percent is confirmed. The retail price premium averages 20 to 30 percent.

Sales in small, specialised natural and health food shops were important up until the nineties. Today however, conventional supermarkets are gaining more and more importance for the marketing of organic products. In addition the Superettes, small specialised bio-supermarkets, with self-service and a surface area of 200 to 500 square meters, partially replace, but also supplement the small specialised shops. The chain Biocoop distributes about ten percent of all organic products to specialized food stores and to conventional retailers. Other organic chains operate about 42 shops nationwide (Rayons Verts, Satoriz, Naturalia, La Vie Claire, La Vie Saine, L'Eau Vive, Croc Nature).

Today nearly half of organic food is sold through conventional supermarket chains, with the rest sold through health food stores, direct sales, and open-air organic food markets. Some major conventional retailers have invested seriously in the organic sector. One example is Carrefour: the brand 'Carrefour Bio' was launched in 1997 and currently offers about 130 ECOCERT certified products. The hypermarket chain Cora uses the brand Nature Bio for its range of organic products certified by AB.

Five conventional retail chains, Carrefour, Intermarché, Casino, Leclerc, Système U, hold a 73.3 percent share of the French conventional retail market. In 1998, France's organic imports were valued at € 50 million. The main products from non-EU countries included exotic fruits (avocado, mango and bananas), coffee, tea, citrus fruits and cereals from African, South American and Asian countries as well as from North America. Total imports accounted for about ten percent of the organic food market.

Germany

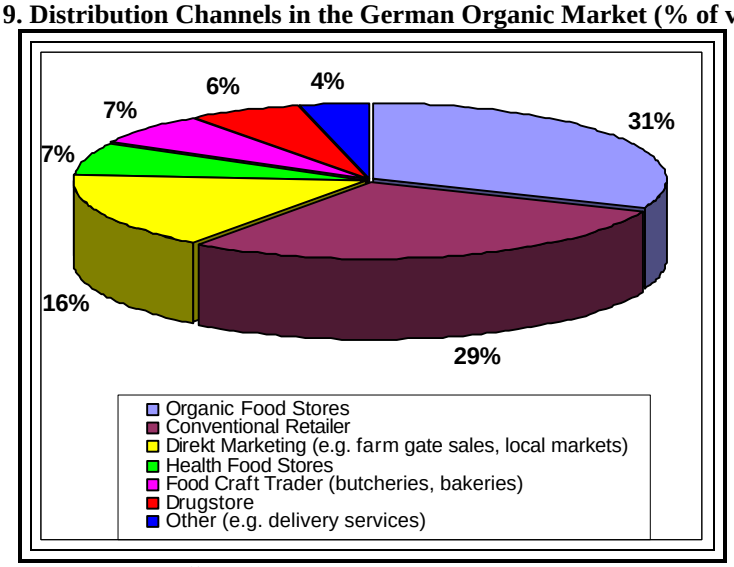
In 2002, according to IFOAM, the value of the organic market in Germany was estimated at US$ 3.06 billion. Some market analysts estimate the growth rate at 10.3 percent, with sales reaching about € 5.2 billion in 2007. The per capita expenditure for organic products in 2003 was € 37. As reported by the Research Institute of Organic Agriculture (Forschungsinstitut für biologischen Landbau – FiBL)[20], in 2002 the German market shares for some specific organic products were as follows: Potatoes 4.9 percent, Milk 3.1 percent, Eggs 2.8 percent, Vegetables 2.7 percent, Bread 2.4 percent, Fruit 1.9 percent, Meat 1.5 percent, Yoghurt 1.3 percent, Meat products 1.0 percent and Cheese 0.8 percent. The average price premium in Germany is above the European average, varying between 60 and 70 percent.

In Germany, organic distribution has traditionally been linked mainly to specialized health food stores and direct marketing, while UK, Switzerland and the Scandinavian countries have used the conventional supermarkets right from the early days of organic trade. According to the on-line magazine Bio-Supermaerkte[21], in 2003 the turnover in specialized health stores with a surface area up to 120 m² decreased by 3.7 percent compared to 2002.

[20] FiBL is considered to be the world's leading information and documentation centre for organic agriculture
[21] www.bio-supermaerkte.de

Stores with more than 150 m² surface on the other hand increased their turnover by 6.6 percent. There are almost 200 organic supermarkets with more than 200 m² sales area already accounting for more than 20 percent of sales volume.

Chart 9. Distribution Channels in the German Organic Market (% of volume)



Source: Willer, H.; Yuseffi M., 2004, IFOAM

Some conventional retail chains offer organic products under their own organic brands. As in other countries this marketing technique is intended to accustom clients to organic products. The combination of a brand with organic products is attractive for 'new' consumers as it transmits confidence, a sense of wellbeing and lifestyle. It overcomes the traditional image of the 'green hippie' consumer. Furthermore, the use of a brand helps to position new products in the market.

Some of the leading German conventional retail chains adopting this strategy are Edeka (Bio-Wertkost), Plus (BioBio), Rewe (Füllhorn), Tengelmann (Naturkind), Extra/Real (Naturkost Grünes Land), Globus Handelshof (Terra Pura).

The five major conventional retail chains with a share of 68.8 percent of the German market are Aldi, Edeka, Rewe, Schwarz Group and Metro Group.

Table 5: Overview on some major German retail chains, 1998

Chain	**Branches**	**Turnover bill. DM**	**% market share**	**Bio-Brand Name**
EDEKA	13,381	45,0	20,2	Bio-Wertkost
REWE	8,070	40.5	18.2	Füllhorn
Aldi	3,256	31.9	14.3	None
Markant	13,840	28.9	13.0	None
Spar	9,300	22.5	10.1	In process
Tengelmann	4,382	19.8	8.8	Naturkind
Metro	838	19.4	8.7	Grünes Land
Others	18,589	15.6	6.9	
Total	**71,656**	**221.6**	**100 %**	

Source: ACNielsen Universen, 1999

In Germany, there are even some 'Bio-discount' chains offering certified products at competitive prices (SuperNatural, Denns). The organic producers' organisations all own legally protected logos with which certified farms and certified processors can label their produce. These logos are familiar to German consumers, especially those of Demeter, Bioland and Naturland.

There is an ongoing discussion between some of the major German organic producers on the potential need for specialized wholesalers. Some are convinced that 'protectionism' against conventional products will have adverse effects in the long term. The role of wholesalers is shifting more towards logistical expertise. The specialized wholesaler Weiling supplies about 450 health food stores and assists its clients with marketing support strategies. One of these trade promotion activities is the introduction of the 'green bag'- a weekly offer of a variety of products ordered in the shops by the consumers one week in advance.

Greece

According to the Greek Federal Office for Foreign Trade, the turnover of the Greek organic sector, which is mainly export-oriented, totalled € 18.5 million in 2002. Per caput expenditure for organic products for that year was less than € 10 and is still extremely low. DIO, one of the three Greek control and certification organisations, reports that organized marketing of organic products is only just starting, with marketing organizations being created and expanding within the last few years. Organic food shops have opened recently in the larger cities in Greece (Athens, Thessaloniki) and are now appearing in some of the smaller cities.

As production in Greece is limited to small quantities of a limited variety of seasonal items, many organic products are imported. A certain number of specialised stores buy and sell organic products on a wholesale basis, too. Many of the larger supermarkets chains have installed an 'organic corner, in some of their stores, usually combining whole food and health products. Some even sell packed fresh fruit and vegetables. The price of organic products in super markets is usually very high (about double the conventional price). Stores with organic sections are mainly located in the larger cities. The most important conventional retail chains in Greece are Carrefour, Delhaize Group, Sklavenitis, Veropoulos and Atlantic.

Otherwise organic products can be found scattered in conventional retail outlets and health food shops according to the extent of the interest of the shop owner and the ability of organic farmers to launch their products as items of higher quality (e.g. wine, fruit, vegetables). There is a weekly market in varying locations in Athens at which only organic products are sold. Recently, a weekly organic market opened in Thessaloniki. Many farmers, however, sell their products alongside conventional farmers at the local weekly markets in their districts, or directly from the farm. The difference between products in conversion and organic products is often not well understood, either by most consumers or by shop owners. As the supply of organic products, including products in conversion, is very limited, there is usually no price difference between the two.

Italy

According to the Research Institute of Organic Agriculture (Forschungsinstitut für biologischen Landbau – FiBL), the Italian organic market was estimated to be worth about € 1.45 billion in 2003, with consumers concentrated mainly in the richer Northern areas. More importantly, Italy is the biggest supplier of organic products in Europe.

In Italy, over 50 percent of the organic products purchased are fruits and vegetables, followed by cereals, wine, olive oils, dairy products and vinegar. Compared to other European countries, small retail shops do still play an important role in organic distribution in Italy. In 2002 the average per capita expenditure for organic products was € 23.

NaturaSi is an organic supermarket chain, including butcheries and restaurants, with 37 outlets in Italy. Recently, NaturaSi opened three stores in Spain.

Baule Volante is a pioneer company for the distribution of organic production to specialized health food stores throughout the country since 1987, providing a whole range of products. Ecor is another specialized wholesaler. However, organic production is entering supermarket shelves everywhere and the most important conventional retail chains have introduced their own organic labels such as :(Carrefour: 'Scelgo Bio', COOP: 'Biologica', CRAI: 'Bio', DeSpar: 'BioLogico', Esselunga: 'Bio', Rewe Italia: 'Sì!', Selex: 'Bio Selex').

The chains Coop Italia, Carrefour, Conad, Auchan and Esselunga are the market leaders at the conventional retail level in Italy with a market share of 36.4 percent.

As published in the Italian newspaper Corriere della Sera in April 2004 the new wholesale market in Rome is preparing an area of 4 to 5 hectares for a whole range of organic products, including fruit, vegetables, meat, olive oil, cheese, pasta and biscuits. This first organic wholesale market at a European level - to be housed in an ecologically sustainable structure powered by solar energy - allows buyers to purchase organic products easily and without any additional transport costs. The efficiency increase in the organic distribution chain is estimated to translate in a price reduction of about 20 percent at the consumer level. Currently, prices for organic products in the Italian market have a price premium between 35 and 40 percent. The wholesale market is going to be open to the public once a week.

Ireland

According to the Irish Organic Farmers' and Growers Association (IOFGA), Irish farmers are increasingly looking to organic farming as a viable option, as it can provide extra income through the Rural Environment Protection Scheme (REPS), production of a premium product and lower inputs. On average Irish organic farmers receive a premium of 23 percent for their products.

Presently most organic products in Ireland are sold in conventional supermarkets. Nevertheless market stalls and box schemes play a major role in the marketing of vegetables. Supermarkets, restaurants, hotels and specialized food processors are increasingly interested in organic food production as a direct result of larger media attention given to organic food and the result of consumer surveys. As in other European countries the Irish organic market is set to see the development of specialist retail outlets, organic catering and supermarkets. With growth in the supply base, conventional supermarkets have already shown a keen interest in stocking a larger range of organic products. As has been the case overseas, supermarkets are going to play a bigger role in the sector.

The majority of producers are small scale and while groups of growers in particular areas of the country ensure that the local market is well supplied, organic produce in general is available neither on a large scale nor on a well organised basis to cater for the growing needs of the market. According to surveys, 30 percent of consumers are prepared to pay a 20 to 25 percent premium for organic food.

The Netherlands

The Dutch market for organic products was worth € 364 million in 2001 according to the CBI survey of 2003. The average growth rate for the period 2002 – 2007 is expected to be 9.7 percent, reaching € 0.6 billion in 2007. The Dutch Supermarket Trade Association declared its intention to give preferential treatment and special promotion to organic products.

Up to now, the number and range of organic food products in conventional Dutch supermarkets was low compared to other European countries, but important changes are taking place. 42 percent of organic products in the Netherlands are still sold through specialized food shops. The interest of supermarkets in organic products has increased significantly over the last few years. Since Albert Heijn (AH) - the market leader in the Netherlands - introduced its own organic house brand 'AH Biologisch' at the beginning of 1998, sales through the supermarkets have risen sharply. Over the last four years their market share has grown from 19 to 45 percent.

Sales also take place directly from farms, at farmers' markets or via vegetable box schemes. A subscriber to a vegetable box scheme receives a bag with freshly harvested vegetables and fruit every week. The bag contains mainly regionally grown products. These schemes can be arranged directly with organic farms or with organic food shops and are very popular. While ten years ago it was an unknown phenomenon in the Netherlands, in 2001 45,000 households obtained their vegetables from a shop or a farm every week. Between 1996 and 2001, 300 new processors have acquired a place in the organic market.

Table 6. Retail Prices in the Netherlands for Selected Conventional and Organic Products in € (incl. VAT)

	Albert Heijn Conventional	Albert Heijn Organic	Health Food Shop
Potatoes	1.69	2.49	2.50
Milk	0.65	0.90	1.00
Bread (1/2)	1.41	1.90	1.67
Cane Sugar (kg)	0.93	1.29	2.70
Eggs (4 pieces)	0.97	1.49	1.20
Coffee	1.49	1.69	2.70
Banana (kg)	0.33	-	2.95
Baby Food	0.97	-	1.09

Source: Pierrot J., 2003, CBI

Portugal

One of the major challenges facing organic farming in Portugal is the marketing, since the sector is not yet organised enough to make producers aware of the realities of consumer demand. Most processed organic products are imported, although there are good possibilities for producing some of them in Portugal if this is justified by demand. The fact that Portugal has only ten million inhabitants is often a constraint to investment in new products, even in the conventional market.

According to a survey of 90 organic farmers carried out in 1998 (GEOIDEIA, 1999), 41 percent of those interviewed sold their production at town markets, 20 percent directly from the farm, 30 percent to distributors, 30 percent to industry and 18 percent to consumers' co-operatives. The study also emphasises that marketing is the greatest limiting factor for their activity, either because the demand is still small (mentioned by 42 percent of farmers), the distribution network is weak (66 percent) or there is not enough information about the markets (63 percent).

Spain

Spanish consumers are still not well informed about organic products, but profound changes are taking place in the sector. From being an emerging market with low sales and few competitors, the sector is now entering the growth phase. According to a recent market study[22] , the share of organic foods is relatively small (0.2 percent of the total market) and was estimated to have reached a value between € 123 and € 128 million in 2003. One reason for this low percentage is the high price premium averaging around 100 percent. Nevertheless Spain is expected to show the highest annual increases in the future (19.2 percent) to reach a market value of € 0.6 billion in 2007. Unlike other European markets the specialized shops in Spain still dominate organic retailing with a market share of 85 percent, but the phenomenon of organic supermarkets is becoming more and more apparent and popular (e.g. Comme Bio, Terra Verde, Veritas). The most important conventional retail chains in Spain are Carrefour, Mercadona, Eroski, El Corte Inglés and Auchan.

[22] Joensen M.; 2003, *Organic Foods in Spain 2003*

Direct sales from farms play a subordinate role but there are also some successful examples of weekly fairs. The majority of health food shops (approximately 2 500) offer organic products, and are still one of the most important marketing channels, especially in the cities. Also approximately 20 local associations and consumer co-operatives are promoting and selling organic products. The export of raw materials and semi-processed products to other European countries, where processors incorporate organic ingredients into their product lines, is also of importance. The state provides some support in marketing, for the organisation of organic fairs or for participation in them.

Sweden

Having started at a relatively low level, the organic food market in Sweden is expected to grow at an average annual rate of 17.2 percent, however, it will not reach more than € 0.6 billion by 2007. According to the Swedish Ecological Farmers Association (Ekologiska Lantbrukarnas), the market has developed rapidly since the early 1980's. At that time, organic sales were confined to farm shops and special health food stores. In 1983 the first large-scale supermarket sales of organic products were initiated, based on close co-operation between the organic farmers' marketing co-operative, Samodlarna, and the consumer co-operative chain, COOP Konsum. The product range consisted of simple, unprocessed foods, such as vegetables, potatoes, flour and oat flakes. The establishment of the certification mechanism and a distinct label (KRAV) in 1985 made further expansion possible. The main limiting factors for further development are limited supply, high prices and inappropriate product characteristics.

In Sweden, producer co-operatives were formed for the main commodities at an early stage in the organisation of the organic movement. These co-operatives, although functioning differently, set up markets for organic products and have since played an important role in the overall development of the market. The co-operatives for the milk, grain and meat sectors, which are dependent on infrastructure requiring large investments, decided not to build their own facilities, but instead negotiated agreements with the mainstream processing and distribution co-operatives. In the late 1990's, most of these activities were merged into the mainstream co-operatives and the organic co-operatives served as interest groups to negotiate with the processors, discuss organic marketing policies and strategies, and provide consumer information.

All major retailers distribute organic products. The market shares vary considerably between retailers, geographical areas and product groups. Gröna Konsum– a consumer co-operative retail chain that has 450 shops and is a pioneer in the Swedish organic market – claims that 4.5 percent of its total sales are organic foods.

COOP Konsum has developed the 'Änglamark' private brand for organic products for all the chains affiliated with the consumer co-operative movement (Gröna Konsum, Konsum, OBS, B&W, etc) and claims a 9 percent share of organic products in its range. Anglamark plays a lead role as a pioneer brand within the Swedish consumer cooperatives and an example of sustainable consumption.

ICA– a shop owners' co-operative with 2,100 shops and the largest retail chain in Sweden –set the marketing goal of ten percent organic products by the year 2000. A high proportion of the sales take place under the private brand "Sunda". COOP Sweden facilitates the identification of organic products by displaying a cloverleaf symbol on the shelves. The cloverleaf symbol is also printed next to the organic products on the customer's receipt.

27 percent of municipalities served organic food in schools or hospitals in 1998. An organic vegetarian fast-food restaurant chain, 'Meaning Green', opened seven restaurants in Sweden in 1998. They have plans to establish themselves elsewhere in Europe and in the United States. Almost all major food processors in Sweden have taken up organic products. KRAV now has almost 500 processing units under its inspection. The main limiting factor in organic food processing is still the lack of a reliable supply of raw materials. The organic standards themselves limit the use of certain additives and processing aids and methods, which may also be a restriction. The requirements for separation of organic and conventional products may also create problems.

Organic products have been imported for more than a decade. Imports are oriented towards products that are not produced or not available in sufficient quantity in Sweden and often use the same import channels as non-organic products.

Almost all organic products receive a premium price. Generally the price difference is less for processed products. For some agricultural products, especially milk, producer prices are linked to conventional prices, with a premium fixed either in value or as a percentage. For other products, such as grains, most of the production is contracted in advance with an agreed price. For other products, especially vegetables and fruit, prices fluctuate considerably.

For processed products there are wide differences in retail prices. The prices of some products may be about the same whether organic or conventional, and occasionally the organic version is cheaper. This is especially the case for products with low raw material costs. Also, the pricing policy of the retailers may favour an organic product and other products may be more costly.

Switzerland

The Swiss certification body BioSuisse estimates the share of organic products in the Swiss food market to be about 2.5 percent. In 2003, the per capita expenditure on organics was € 99 and the value of the market was € 726 million. The market for organic food is growing at a rate of 20 percent per year. In 1999, it was worth only € 360 million. .

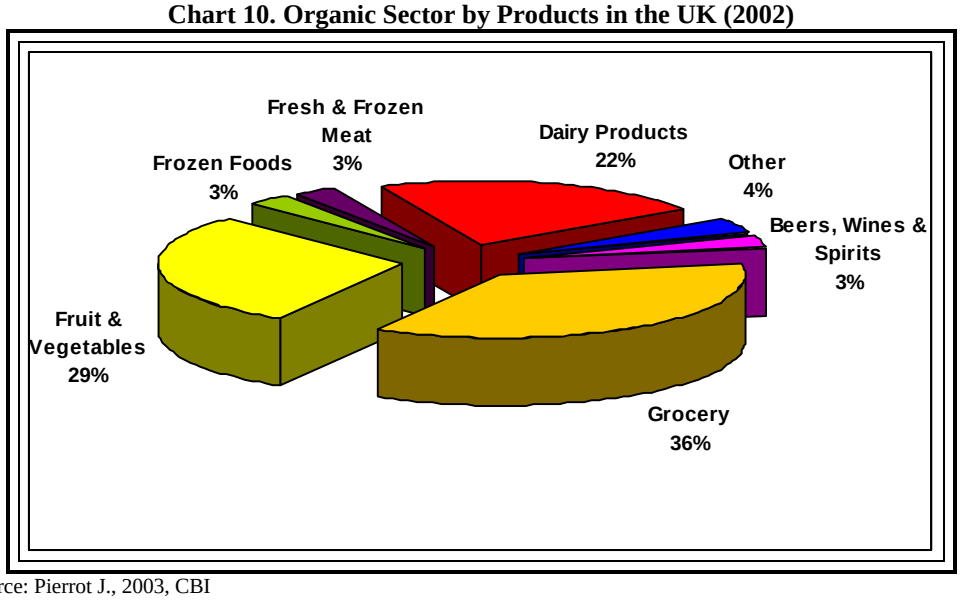
Conventional supermarkets are very important distribution channels. Thanks to the efforts of the two dominant supermarket chains COOP and Migros, Swiss consumers are comprehensively supplied with organic food and the range is almost complete.

According to BioSuisse, COOP controls 49 percent of the Swiss organic market, Migros 25 percent, organic food stores/health food stores 16 percent, direct marketing 5 percent and others 5 percent. In 2002, COOP's market share for food products was 21.9 percent.

United Kingdom

With a turnover of about € 1.7 billion in 2003 estimated by the Centrale Marketing Gesellschaft der Deutschen Agrarwirtschaft (CMA)[23], UK represents the second most important market for organic food products in Europe after Germany. With about 12 percent, UK has one of the highest annual growth rates for the organic sector in Europe. According to a study of Datamonitor, the sector will be worth € 2.6 billion by 2007.

Chart 10. Organic Sector by Products in the UK (2002)



Source: Pierrot J., 2003, CBI

[23] Centrale Marketing-Gesellschaft der deutschen Agrarwirtschaft mbH (CMA), 02/2004, *Agrar Export aktuell*

Historically the market has been supplied by a large number of small scale producers which has occasionally given rise to variations in quality. The conversion of larger producers, who are often more technically and commercially experienced, is expected to favour the development of the market.

According to a USDA study[24], about 82 percent of the sales value of all organic products is now attributed to supermarkets. However, specialist retailers continue to have an important function for local small-scale producers. Even though domestic organic production is increasing, imports still account for 65 percent of retail sales. This means that UK organic market remains highly dependent on imports. Up to now these have been imported mainly from other European countries, due to equivalent standards, lower transport costs and the absence of tariff barriers. Importers are often specialized in organic products and deliver directly to the retail and food service sector. The average organic consumer in UK is between 50 and 70 years old and disposes of a relatively high income.In addition, young families with children are particularly interested in organic food.

Organic products generally command a price premium in retail outlets, reflecting the higher costs of production. However, the increasing dominance of supermarkets in the organic food sector has prompted concern over the longevity of price premiums.

In UK, some organic lines are under pressure to meet the every day low pricing offers that currently characterize the food retail sector. Organic suppliers and certification bodies have both questioned such pricing initiatives. They highlight the fact that without acknowledging the higher production costs faced by organic farming systems, supermarkets are effectively risking the sustainability of their supplier base.

Food retailers in UK have investigated different pricing strategies for organic foods. For example one of the leading supermarket chains, Sainsbury, dropped prices of selected organic products to the same level as conventional lines. Following a negligible impact on sales performance, the original pricing levels were reinstated. Sainsbury realized sales of organic products totalling US$ 376 million in 2002. The Organic Partnership scheme, which includes collaboration with organic suppliers in order to broaden the product range, was launched by Sainsbury in 2001.

UK remains one of the fastest growing markets for organic food products. Confirmation of this development is the arrival of the US giant Whole Food Market on the UK market through its purchase of the organic food retail chain ‘Fresh &Wild’.

According to the USDA study, the retail chain Waitrose claims a share of 6.5 percent of organic food products in its sales, equal to a 10 percent share of the total UK organic market. Tesco, the leading multiple retailer in UK aims at a target of US$ 1.6 billion in sales of organic products by 2006. Other major retail chains in UK are Wal-Mart, Safeway (now taken over by Morrisons) and the Big Food Group.

Marks & Spencer has also recognized the potential of organic products and is widening its range (currently about 190 products) under its own label ’O’.

3.3. JAPAN

Japan has the potential to become a vast organic food market as consumer demand currently exceeds supply. One reason for the insufficient national production is the introduction of new and stricter standards for the organic food industry by the Japanese government in 2001.

[24] USDA Foreign Agricultural Service, GAIN Report Number UK3006, 2003

The JAS-label is based on ISO 9001 standards and requires third party certification. It is becoming increasingly recognized by Japanese consumers as a symbol for quality. Japan also has a second label, created in April 2004. It is a label for specially grown agricultural products ('Tokubetsusaibai') and basically consists of a set of voluntary guidelines.

An ITC/FAO/CTA study [25] estimated that the value of the organic market in Japan would rise to US$ 350-450 million in 2003. Other sources propose figures that are up to ten times more. This confusion is due to the definition of organic food before the introduction of the JAS legislation.

Until 2000, the term 'Yuki Shokuhin' was applied to various categories of food, including organic, but also to food produced with no, or reduced, pesticides or grown without chemical fertilizer or with reduced fertilizer, accounting for a total value of about US$ 2.5 billion. The primary products included in the above are fresh vegetables and fruits (about 70 percent), rice (about 20 percent) and processed and other foods (10 percent).

Facilitated by an improving economy, the Japanese market for organic products is expected to keep on growing at about 20 percent per year. Even though consumers are still not well informed about organic products there is a high level of market acceptance, which indicates a considerable potential in this market.

Organic food is easily integrated into Japan's food pattern. For all its industrial qualities and technological achievements, Japan is still attracted by principles such as living in harmony with nature. Japan's deep respect for the ancient arts, for craftsmanship, for local and regional distinctions all fit in with the values implicit in organic food and farming.

Unlike other modern industrialized nations, Japan still patronizes its small local retailers. 70 percent of total retail food sales take place in the more than 1 million small food stores around the country. Of the 1.4 million food outlets, large retailers account for less than 10 percent of sales. Home delivery services are popular and almost all stores deliver.

The most successful food retailers in Japan are the 40,000 small convenience stores that are found everywhere. A fairly new chain of small stores featuring organic and natural foods has established 500 stores nation wide, under the brand name 'Anew'. They also sell from a catalogue and do home delivery. Another important traditional distribution system for organic products is the so-called 'Teikei System', which is based on an agreement on the production methods between producers and consumers

However, as is already the case in the United States and Europe, Japan's conventional supermarkets are also adding more space for organics in order to strengthen their market share.

3.4. OTHER COUNTRIES AND REGIONS

Australia

Although Australia has the world's largest area of certified organic farm land, it remains a fairly small market for organic products. Most of its production is exported. As reported by IFOAM, most of the 10.5 million hectares of organic land in Australia are dedicated to beef production.

Important crops however include fruit and vegetables that are produced all year around, dairy products (a rapidly growing sector), rice, herbs, vegetable seed, wine, wool and mutton. It is estimated that the total production value of the organic industry is in the vicinity of US$ 150 million. Approximately 40 percent of this is estimated to be for export, with the remainder for domestic use (May 2002).

The market is reportedly growing rapidly, albeit from a small base. On the domestic market, organic

[25] 'World Markets for Organic Fruit and Vegetables', ITC/FAO/CTA, 2001 (CTA- Technical Centre for Agricultural and Rural Cooperation ACP-EU)

produce receives a substantial price premium compared with conventionally grown produce. For cereals and livestock products this ranges from 50 to 75 percent and for fruit and vegetables between 50 and 60 percent. Most organic food is sold through supermarkets, but also in specialised shops and restaurants.

New Zealand

New Zealand is another important producer of organic food. Its exports, mainly fresh fruit, but also fresh and frozen vegetables, honey and some meat, are significant. In New Zealand a variety of different food products is now available as certified organic, but the main ones are kiwifruit, apples and vegetables. Organic kiwifruit and organic apples now represent more than 5 percent of total production in those sectors for New Zealand. A wide range of top quality organic wines and beers are also available. Dairy and livestock farmers were slow to convert in the past, but with encouragement from processors more conversions are now taking place.

New Zealand has declared itself GE-free (genetical engineering). This means that no GMOs are imported, developed or used in agriculture or the environment. However, appropriate use in medical research and medicine is accepted. In New Zealand organic food is sold through licensed operators, 500 associate members and the general organic shops found throughout the country. Due to demand there are now organic sections in most supermarkets.

Canada

Most organic products produced in Canada are exported, primarily to the United States. Canada also exports to the European Union and Japan. Retail and food service sales of processed and non-processed organic products are estimated to be between US$ 460 million and US$ 660 million, and are expected to grow to US$ 2 billion by 2005. The organic industry's goal is to represent 10 percent of total retail food sales by 2010.

The Certified Organic Associations of British Columbia (COABC) is a particularly active group in promoting organic production methods. The most important distributor of fresh organic products in Canada is Pro-Organics. The domestic organic market is strongest in British Columbia, Alberta, Quebec, and Ontario.

Russia

The organic sector in Russia still lags still far behind the European countries. The Moscow Times of 21 April 2004, reported the opening of the first organic food store in Moscow, The 'Rizhaya Tykva' ('Orange Pumpkin'). This belongs to one of the first organic food companies (Ecomarket) and offers more than 520 different organic products. In the absence of national organic production, these are imported, mainly from Western Europe. Compared to conventional products the prices are sensibly higher.

Africa

In North Africa, local marketing of organic products is growing, particularly in Egypt, where the Sekem farm has been leading the marketing of organic cotton products and tea, which is sold in about 10,000 pharmacies and shops across Egypt.

In sub-Saharan Africa, the domestic market for certified organic products is developing but very slowly. This is partly due to low income levels and the low level of organisation of the organic movement in Africa. Nevertheless, efforts to establish organic markets in Uganda, Malawi, and Kenya. have been initiated.

Both Uganda and Tanzania have a large number of smallholders engaged in certified organic production, making these two countries the leading organic producers. Most of these smallholders are participating in the 'Export Promotion of Organic Products from Africa programme', (EPOPA), funded by the Swedish International Development Cooperation Agency (SIDA). In this context, farms in Uganda produce fresh organic fruits and vegetables, coffee, cotton, sesame, tilapia, and Nile Perch.

South Africa has a growing organic market with products being sold in several specialised stores and supermarket chains. Large supermarket chains such as Woolworths, Pick'n Pay, Hyperama and Shoprite Checkers are planning to introduce an extensive organic product range.

Asia

In Asia, the area under organic management is comparatively small. Among the more significant countries producing organic products are, India and Indonesia and in particular China In most Asian countries no local markets for organic products exist and local distribution is a major problem. Often a price premium for organic products cannot be obtained

In Malaysia and the Philippines organic products are sold through specialised stores and supermarkets. In China, organic agriculture is in its relatively early stages, although it has the largest organic area of all Asian countries. The Organic Food Development Centre of China **(**OFDC) has been involved in organic inspection and certification since 1994. This governmental organization operates under the State Administration of Environment Protection.

The main tasks of OFDC are to control agro-environmental pollution caused by heavy application of synthetic pesticides and fertilizers, to promote the development of organic agriculture and to provide certified quality organic food for consumers. OFDC has developed standards on organic food production and processing and regulations regarding the OFDC organic Logo (formally registered and protected by Chinese law) that have been approved by the Administration .

According to the OFDC[26], the Chinese domestic organic market started in 2000, and has been expanding rapidly. Presently, the main organic foods available include fresh vegetables, tea, rice, fruit and honey. In accordance with the estimated organic acreage and average productivity, the total value of organic and organic-in-conversion products certified in China, in 2002 was about US$ 185 million. About two thirds (US$ 125 million) was sold formally, with about 80 percent (US$ 100 million) destined for the international market and 20 percent (US$ 25 million) for the domestic market.

The market share of Chinese organic products in the international market is about 0.5 percent. It is estimated that by 2005 organic exports will double, reaching US$ 200 million, which would account for about 0.6-0.7 percent of the world market. It has been predicted that in 2010 the share of organic food in China's domestic market may reach 1.0-1.5 percent (US$ 2 billion) and its target share of the world organic market may be close to 3 percent (US$ 2.5 billion).

About two thirds of the provinces and autonomous regions in China are involved in organic production, processing and trading. Zhejaing and Anhui provinces in the eastern part of China have been the pioneers of organic farming.

In 1992 the Chinese Ministry of Agriculture established the China Green Food Development Centre (CGFDC). This centre formulates programs, policies and plans for developing 'Green Food', administers the use of the Green Food label and organizes the formulation and harmonization of the various standards for these products.

There are two grades of 'Green' Food: the 'A Grade Green Food', which allows the use of limited and specified agrochemicals at safe levels, and the 'AA Grade Green Food', which is quite close to organic in terms of production standards. By the end of 2001, more than 2,000 Green Food certificates had been issued on products produced by various farms across China, amongst which 48 were certified as 'AA Grade Green Food'.

The success of the green food sector, especially the 'AA Grade Green Food', has provided China with a sound agricultural experience for the future development of organic systems. Certified products include soybean, buckwheat, sesame, sunflower and pumpkin seeds, rice, walnuts, pine nuts, tea,

[26] Xie Biao, OFDC, 'Organic Products Markets in Asia – Focus on organic aquaculture products', Organic Aquaculture and Sea Farming Conference, Vietnam, 2004

apiculture products, medicinal herbs and milk, and a few processed products such as noodles, fruit juices and other beverages.

The non-profit organization the Intercontinental Centre for Agroecological Industry Research (ICAIRD) was established in early 1998 by professors, experts and technicians in the fields of plant ecology, agroecology and organic food development. Professor Li Zhengfang, the President of ICAIRD, is considered to be the founder of the Chinese organic agriculture movement.

Jiangsu Ruikang Organic Food Trade (JROFT) was established in 1995 as one of the pioneers of the organic agricultural movement in China. JROFT cultivates organic tea, organic liquorice and organic star anise according to OFDC regulations.

Up until 1999, more than 95 percent of certified Chinese organic products were exported, especially to Japan, EU countries and North America. However, in the last two years food safety issues have become a growing concern in China, resulting in the growth of the domestic organic food market. In addition, the Chinese State Administration of Environment Protection has implemented an organic food production programme and issued regulations known as the 'state organic food production base criteria' in April 2003.

In India, especially in the major cities, the market for organic products is growing. India produces primary organic products but processed foods are limited. Organic products grown in various agro-climatic zones are coffee, teas, spices, fruits, vegetables and cereals as well as honey and cotton. Organic animal husbandry, poultry and aquaculture have yet to start.

The Middle East

Lebanon's organic market is developing slowly, currently offering mainly fresh products. The head of the EU delegation prepared an overview of the status of the organic sector in Lebanon in 2004[27]. Two NGO's are driving for the organization and certification of production in order to create a more diversified and stable supply and a reliable distribution system. At present the French certifier 'Qualité France' and the Italian 'Istituto Mediterraneo di Certificazione' are controlling the compliance of production with organic standards. Draft national regulations were been submitted to the Cabinet in February 2004.

Israel has an organic food production, mainly composed of dried and fresh fruits and vegetables and nut. Organic products are sold through specialised stores and supermarkets. As will be seen later, some organic aquaculture products are also available.

Latin America

Almost all Latin American countries have an organic sector, though the level of development varies considerably. The countries in Latin America with the highest percentages of organic land are Argentina, Uruguay, Brazil and Chile.

Most Latin American countries have specialised outlets or health food stores, where organic farmers can take their products for sale to an informed clientele. However, probably the most popular form of organic distribution in Latin America is the farmer's market. Many local governments subsidise this type of marketing, helping the farmers by providing stalls and promoting the events. Although individually these local markets have only a small economic significance, they are very important for small farmers and in total they represent an important part of the continent's overall organic market.

Another important distribution system is the box scheme. In the big cities, many producers organise a weekly home delivery service, as is the case in some European countries, with boxes containing vegetables and fruits and sometimes milk products and eggs brought in by other farmers. More recently supermarkets have begun to sell organic products. For example organic vegetables can now be found in supermarkets in Uruguay, Costa Rica, Honduras, Peru, Brazil and Argentina.

[27] Renault P., 03/2004, *Lebanese organic agriculture begins to get organized*, www.terra.net

In Argentina, organic produce is supplied to a range of supermarkets by producers who have come together in groups in order to offer a wider variety of organic fruits and vegetables and make them available to all segments of society.

The range of processed organic products on sale is limited due to the difficulty in obtaining sufficient quantities of raw material. However, there is also a wide variety of organic oils, flours, honeys, wines, and teas on the shelves. Some supermarket chains have developed their own organic brands for their clearly defined organic sector. The Argentinean company Sol de Acuario has a wide variety of certified products in the supermarkets, ranging from teas to breakfast cereals and corn flour.

In Brazil, some producers' associations, like 'Cae Ipé' in the southern states, collect their members' vegetables and fruit once a week and take them in their own trucks to the major cities, selling in farmers markets or supermarkets under the name of the farmer or the brand name of the association.

In Ecuador the organisation MCCH (Maquita Cushunchic Comercializando Como Hermanos) operate a very similar system, but on a smaller scale.

In Mexico, over the past five years, the organic farming area has grown from 25,000 hectares to over 100,000 hectares, with exports to Europe, Japan, and the United States reaching US$ 100 million a year, according to the Mexican Secretariat for Agriculture. Mexico is now the leader in organic coffee production, and one of the top producers of organic avocados, mangos, bananas, pineapple, papaya, jicama (sweet turnip), sesame, vanilla, cocoa, and soybeans. Exports are destined for Germany, the Netherlands, Switzerland, Italy, France, the United Kingdom, Spain, Japan, the United States, and Canada.

Despite a growing demand for organic products in Latin American countries, the export market remains the main outlet. This trend is typical of the southern countries, with poorly developed national markets and in need of export revenues to help pay their international debts. It should also be noted that the basic products are normally exported from these countries as raw material without any added value, and that processing tends to take place in the developed countries for their domestic markets.

4. ORGANIC AQUACULTURE

4.1. OVERVIEW

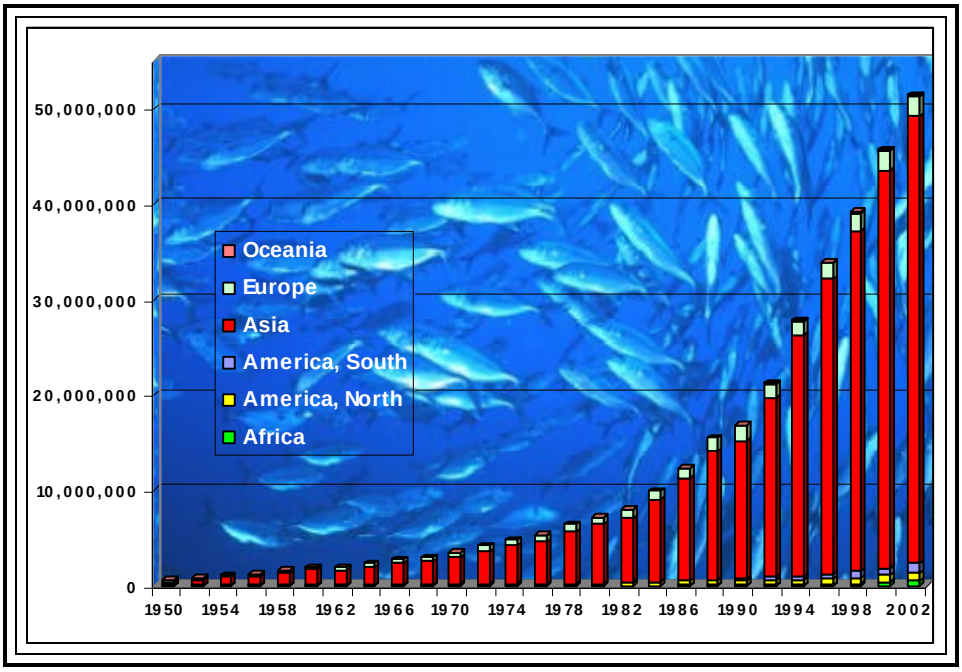
According to studies undertaken by the International Food Policy Research Institute (IFPRI) and FAO, global per capita seafood consumption is estimated to increase from the current 15.8 kg to 17.1 kg in live weight in 2020.

Global population increase, positive nutritional aspects of fish compared to other sources of proteins as well as frequent scandals related to intensive animal farming are the main factors for this increase. According to Euromonitor, the total volume of sales of fishery products (fresh, chilled, frozen, dried, salted, smoked and canned fish and shellfish) in the EU amounted to almost 3.7 million mt in 2001, indicating a per capita consumption of 23.9 kg. EU consumption has increased regularly in recent years, although the rate of increase is now likely to be more modest than in the past. In general, prices of fishery products are rising faster than sales volume, thus the growth of sales in value terms in 2001 was stronger than for volume.

Aquaculture might be broadly defined as the establishment of man-made enclosures to raise aquatic life forms, such as shellfish, fish, and sea weeds for human consumption. The aquaculture process itself is ancient, having appeared in traditional, less-intensive forms 2000 or more years ago in Asia and other parts of the world. Asia continues to be the undisputed leader in world aquaculture production.

Aquaculture and organic agriculture are the fastest growing sectors of the world food economy. With regard to seafood, aquaculture will play the leading role in future fish supply. At present around 220 species – out of 27,000 known fish species – are raised in fish farms all over the world. Some of the most important, in terms of quantity, are shrimp, salmon and tilapia.

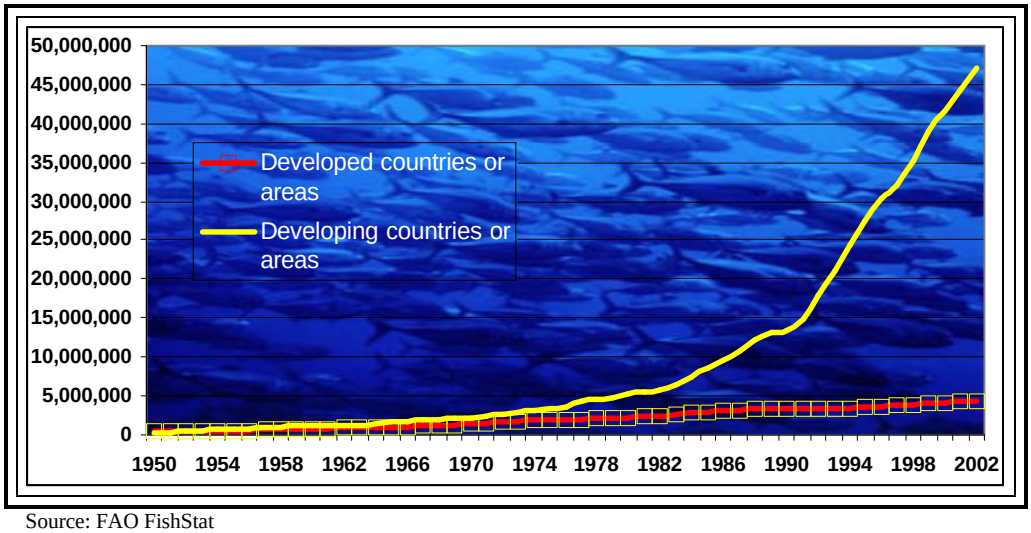
Chart 11. Aquaculture Production by Major Regions (mt)



Source: FAO FishStat

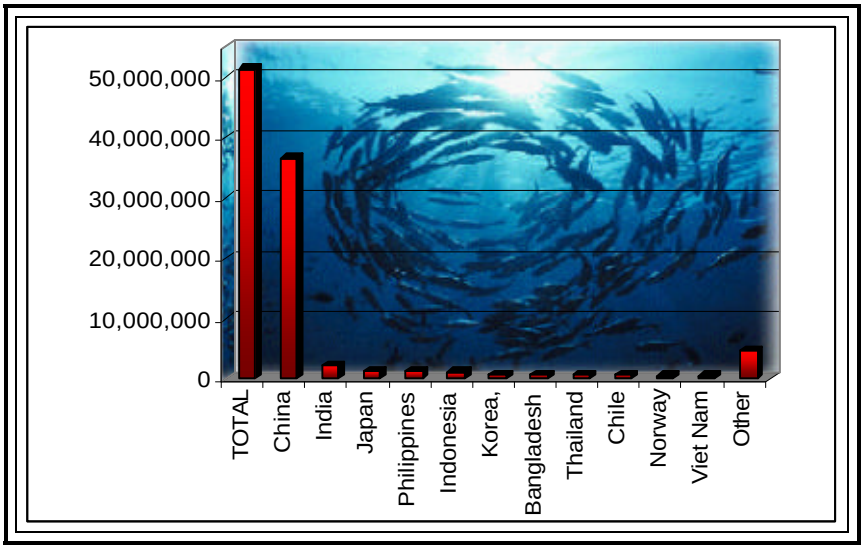
Chart 11 confirms Asia's leading role in aquaculture production in terms of production quantity as well as value.

Chart 12. Aquaculture Production in Developing and in Developed Areas (mt)



Source: FAO FishStat

Chart 13. Aquaculture Production by Countries in 2002 (mt)

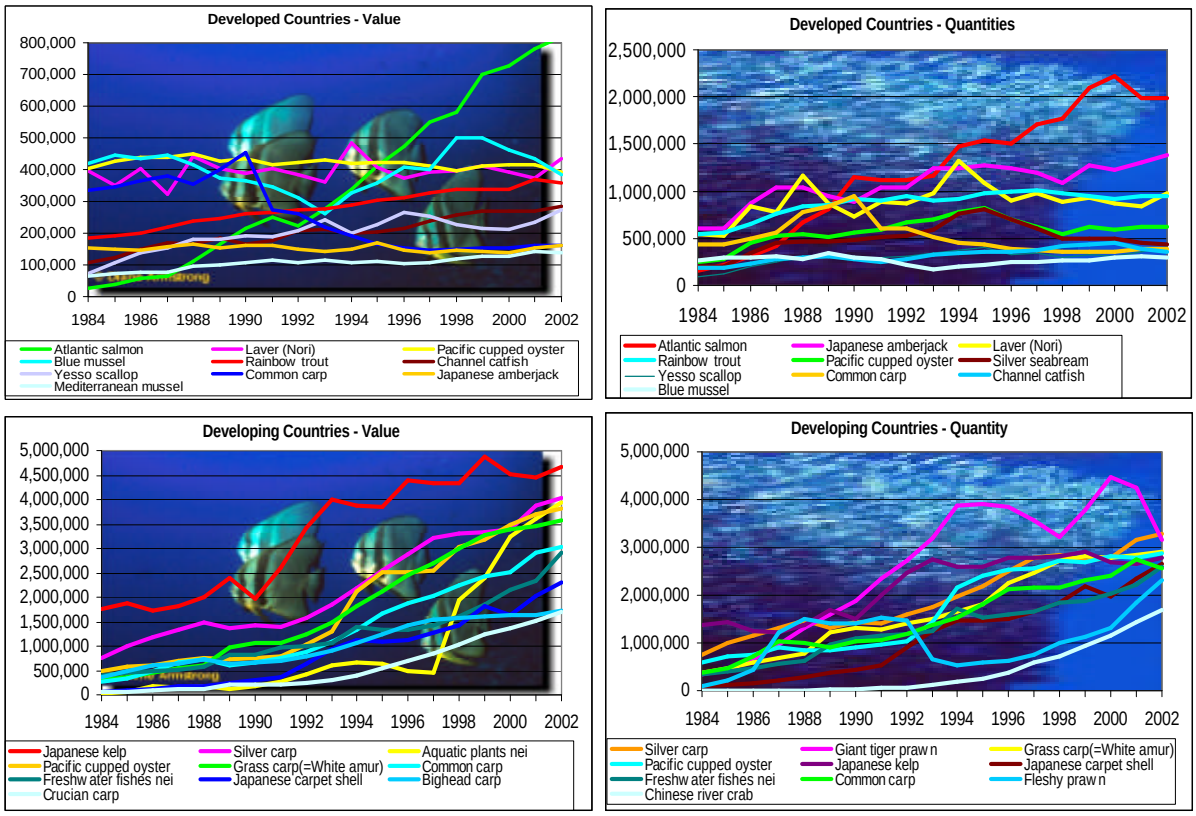


Source: FAO FishStat

The following charts indicate the major species produced in developed and in developing countries in terms of quantity and value.

The markets in developed countries require mainly high value species such as salmon, trout and shrimp, which developing countries, with the exception of shrimp, do not farm in the same quantities as traditional species such as carp. However, China – which will become an ever more important player in the future – has started the cultivation of salmon and rainbow trout and is already providing considerable volumes of flounder, seabream and mullet.

Chart 14. Aquaculture Production by Major Species in Developing and in Developed Countries (mt and 1,000 US$)

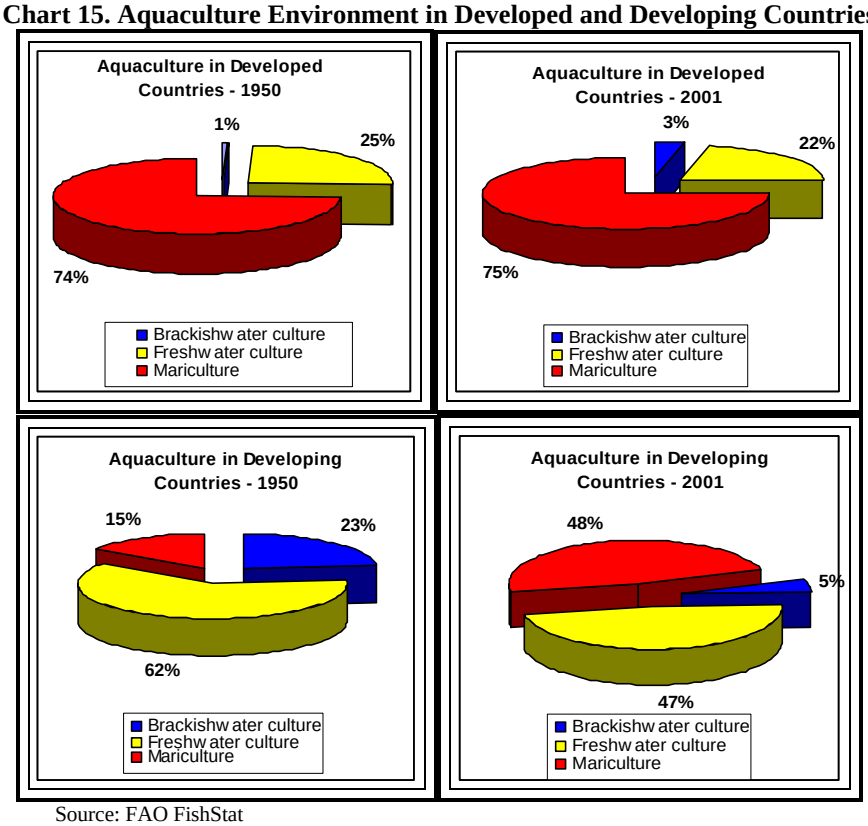


Source: FAO FishStat

As illustrated in the charts below, aquaculture production in developed countries is concentrated mainly in marine water environments. There have not been any significant changes in the share of the specific production environments – brackish water, freshwater and marine water – over the past fifty years, even though production has increased from 367,476 mt to 4,167,502 mt in 2001.

In developing countries, the changes in aquaculture production environments are more accentuated. The share of mariculture has increased considerably while the share of freshwater and brackish water culture has decreased. But most importantly, production in these countries increased by more than 16,000 percent over the past fifty years.

Chart 15. Aquaculture Environment in Developed and Developing Countries



Source: FAO FishStat

Due to the stagnation in capture fisheries, aquaculture has become the sole source of supply growth in the fisheries sector during the 1990s, raising hopes that the growth of aquaculture may ease pressure on threatened wild stocks. However, aquaculture is not without its own environmental problems.

The largest share of world shrimp production comes from farms in South-East Asia and Latin America. Intensive aquaculture with application of antibiotics and growth hormones leads to residues in the harvested seafood and to pollution of the environment. After just a few years intensive shrimp farms become unusable because of the massive presence of nutrients and pesticides. Substantial efforts are now being made to build and operate shrimp farms that are environmentally and ecologically sustainable. The negative impact of shrimp farming on mangrove forests for instance has been judged as unacceptable, as this particular environment represents the nursery areas for other fish stocks on which local fishing communities depend.

Most controversially, the increasing use of fishmeal and fish oil in the feeds of farmed fish has also raised concerns that some forms of aquaculture may in fact be harming wild fish populations rather than easing pressure on them. These concerns will become increasingly prominent as demand for fish grows over the coming years. Negative externalities generated by aquaculture include effluent pollution, escaped farmed species, land and habitat disturbances and possible ecosystem harm created by demand for wild seed, brood stock and feed inputs. The uncontrolled and excessive use of

antibiotics may lead to reduced resistance to pathogens, not only in fish, shrimp and bivalves - but also in seafood consumers.

Marine fish farming has been heavily criticised for its environmental impacts, including pollution from fish waste and uneaten food, escapees, chemicals used to control disease and parasites, and the ecological impacts of sourcing raw material from the sea to produce fish. Media headlines on the depletion of wild stocks and on possible contamination of seafood with mercury and dioxins may lead to an increased demand for controlled and certified products. Furthermore, as organic standards do not allow the use of genetic modification in production and processing, organic aquaculture products responds to the needs of consumers who wish to avoid genetically modified seafood.

Organic Aquaculture

Organic aquaculture is basically a market-driven initiative corresponding to the growing consumer awareness of health and environmental issues. Even though the term 'organic' would be associated by many consumers with 'natural' and subsequently 'wild' products, organic fish production does, by definition, only concern aquaculture, as the production cycle of wild fish cannot be controlled entirely. Organic production requires full control over the entire production process, including control of all input factors such as juveniles, feed and water quality. In the absence of a universally accepted definition, organic aquaculture is generally considered to have certain basic characteristics:

- sites regularly replenished with pollution free water
- fish of natural origin and selection (absolutely no GMO and hormonal treatment)
- feed based on controlled meals, oils and so on (no GMO)
- limited and monitored treatment with medicines (preference for natural remedies)
- low breeding/stocking density
- longer rearing periods
- continuous monitoring of environmental impacts

There are also considerations regarding the localisation of production units and harvesting areas as well as the post-harvest handling practices. There are some major divergences in the currently applied public and private standards, primarily as regards the definition of stock density, rearing capacity, feed for carnivorous species and acceptable veterinary treatment.

Basically, organic aquaculture has to assure biodiversity, the integrity of biological cycles and biological activity. A balanced, sustainable production cycle is the outcome of a successfully implemented organic aquaculture production system. Organic aquaculture and organic agriculture are closely linked, as the feed used in organic aquaculture is provided partly by this sector. There are some critical points which are not yet totally clear regarding organic aquaculture, like, for example, feed and nutrients.

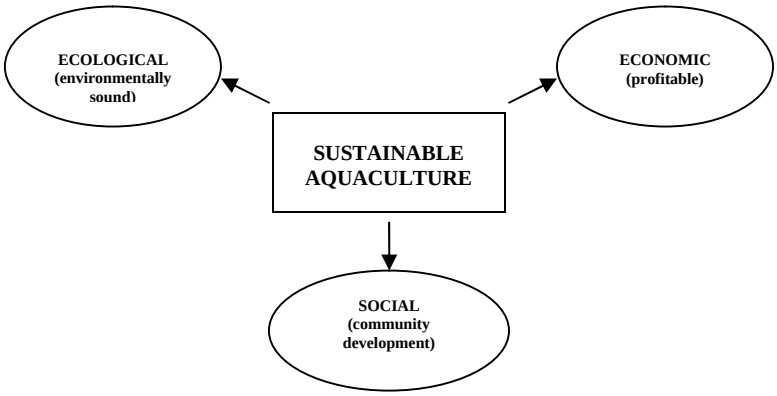
The question of feed is particularly sensitive for the farming of carnivorous species. Discussion on the correct use of fishmeal, fish oil and colour additives is still ongoing. Researchers are engaged in the search for possible substitutes for fish meal and oil, but most probably only partial substitution will be possible, if the quality of taste, nutritional values and animal health are not to be affected.

Waste management also represents an important issue and the best options seem to be an integrated system combined with organic agriculture (crop and/or livestock production), hydroponics or the combination of different fish species in order to make the optimal use of a pond (polyculture). Similar concerns exist for net cage systems in the sea. With the expected expansion of aquaculture in the future, it will be vital to develop sustainable practices to avoid environmental and social problems.

Organically certified aquaculture is a recent and important development. However even though aquaculture has been expanding at a very high rate (average of 9 percent since 1970), the production of certified organic aquaculture products remains extremely low and variety is limited, compared to organic agriculture products.

On the demand side, it is evident that consumer confidence in the safety and integrity of food supply in general has been eroded by a number of scandals. As a result a section of relatively affluent, environmentally conscious consumers have turned to the organic movement to certify the integrity of the products they purchase. They are prepared to pay a premium of up to 75 percent for such products from aquaculture. As yet there are no internationally agreed regulations for organic aquaculture production and so standard setting is still largely a private matter, albeit verified by third parties, and governed by legislation regarding consumer protection and fair competition in the market.

Organic fish farming requires the application of organic principles in order to create a balanced system for fish, environment and consumers. Organic seafoods currently represent a niche in the segment of organic products. However the absence of detailed information about them compared with that available for organic agriculture products is indeed striking. A keyword internet search using 'www.yahoo.com' carried out in April 2004 confirmed this by providing about 1 830 000 hits for the keyword 'organic agriculture' and only 153 000 hits related to 'organic aquaculture'.



No official statistics on certified organic aquaculture production are yet available, but Naturland estimated that global production reached about 5 000 mt in 2000, produced mainly in European countries. According to FAO[28], this figure represents only about 0.01 percent of global aquaculture production. At the European level, this share rises to about 0.25 percent. According to Naturland, between 4 400 and 4 700 mt of this production was marketed in Europe (4 000 mt of Irish and Scottish salmon to Austria, Belgium, France, Germany, Luxembourg, Netherlands, Switzerland and UK; 100-200 mt of Scottish and German trout; 200-400 mt of Austrian and German carp/freshwater species; 100 mt of Irish blue mussels for Germany). In 2003, organic aquaculture production is estimated to have already reached about 7 500 mt (5 000 mt of salmon, 500 mt of Carp and trout, 1 500 mt of shrimp and 500 mt of other species).

An overview prepared by the French Fédération National d'Agriculture Biologique (FNAB) gives slightly different figures proposing a production of 8 367 mt in Europe in 2003 (no information on ex-European production quantities). The divergence of the figures published is indicative of the current status of this market segment, which is still insufficiently regulated and reported. Thus one major concern for the future will be the collection of reliable data in order to evaluate the market situation in a realistic and coherent way.

The European Inland Fisheries Advisory Commission (EIFAC), a scientific and technical authority created by FAO, established an Ad hoc Working Party on Organic Fish Farming during its Twenty-first Session in Budapest in 2000.

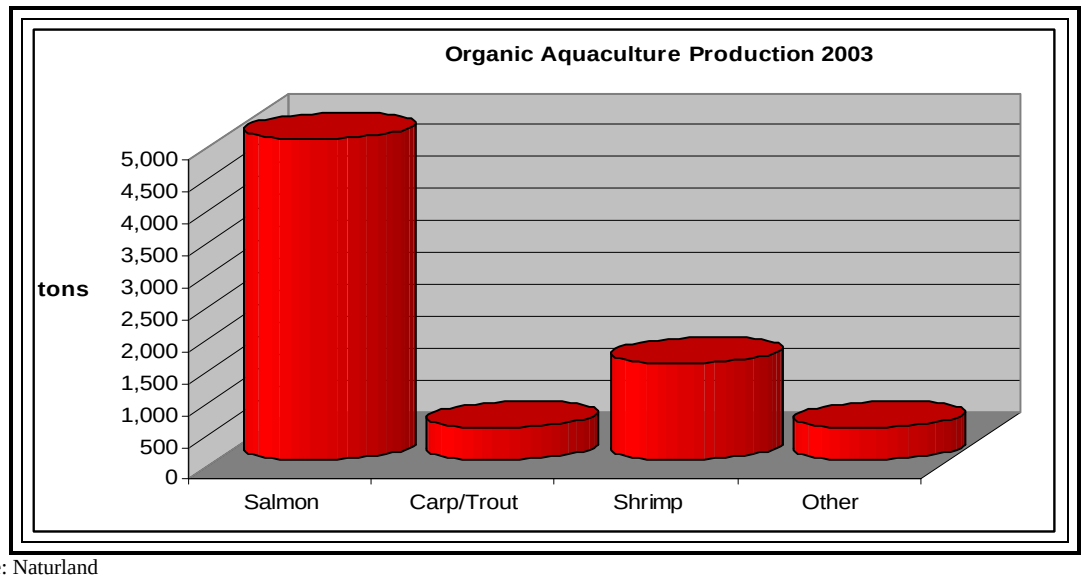
[28] *Organic agriculture, environment and food security*, FAO Environment and Natural Resources Series No. 4

Table 7. Organic Aquaculture Production in Europe 2003 (mt) – not exhaustive -

	Trout	Salmon	Trout cultured in marine water	Seabass/ Seabream	Sturgeon	Carp	TOT.
Austria	10					20	30
Germany	150					150	300
Spain	300				200		500
France	300	7	30	150			487
Ireland	120	3,000					3,120
Italy	100						100
Norway		20		40			60
UK	350	3,500					3,850
Switzerland	220						220
Denmark	X						
TOTAL	**1,250**	**6,527**	**30**	**190**	**200**	**170**	**8,367**

Source: FNAB

Chart 16. Organic Aquaculture Production in 2003 by Major Species (mt)



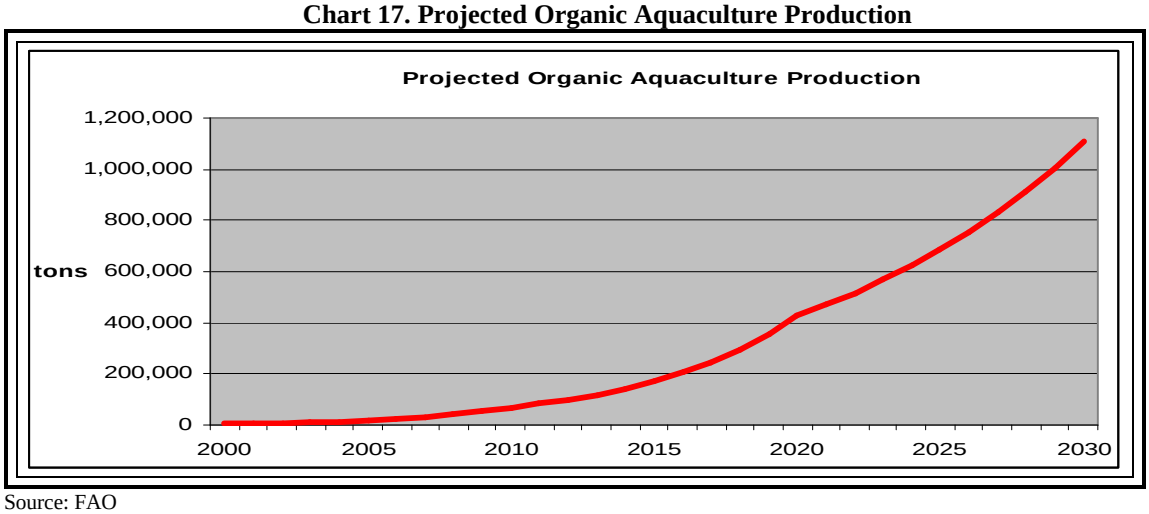
Source: Naturland

An FAO study[29] is estimating a compound annual growth rate for organic aquaculture products of 30 percent from 2001 to 2010, 20 percent from 2011 to 2020 and 10 percent from 2021 to 2030. This would increase production of organic aquaculture products to 1.2 million mt. The future of organic production would change further if developing countries entered the market with officially certified and labelled products.

Considering the potential future growth in conventional aquaculture, organic production will nevertheless remain a relatively small sub-sector.

[29] FAO, 2002, *Organic Agriculture, Environment and Food Security*

Chart 17. Projected Organic Aquaculture Production



Source: FAO

Nevertheless, demand is growing fast and the range of organically reared species is expanding. It already includes salmon, shrimps and prawns, trout, carp, mussels and oysters and production is increasing at rates up to 25 percent annually. The main markets for organic aquaculture products are Europe, the United States and, increasingly, Japan. Average production costs are usually between 20 and 30 percent higher than for conventional products but are covered by adequate price premiums. Depending on the species and the type of product/value-addition, the price premium can be considerable. High risk products like meat, eggs and of course seafoods are considered competitive by consumers even at higher prices. Retailers are aware of the growing consumer demand and show a big interest in organic products. However the price constraints are often still a limit to further development of this market segment. A retail price of € 75 per kilo for smoked 'bio-salmon' in Germany for example, is certainly difficult to defend.

Table 8. Export and Retail Prices for Conventional and Organic Aquaculture Products

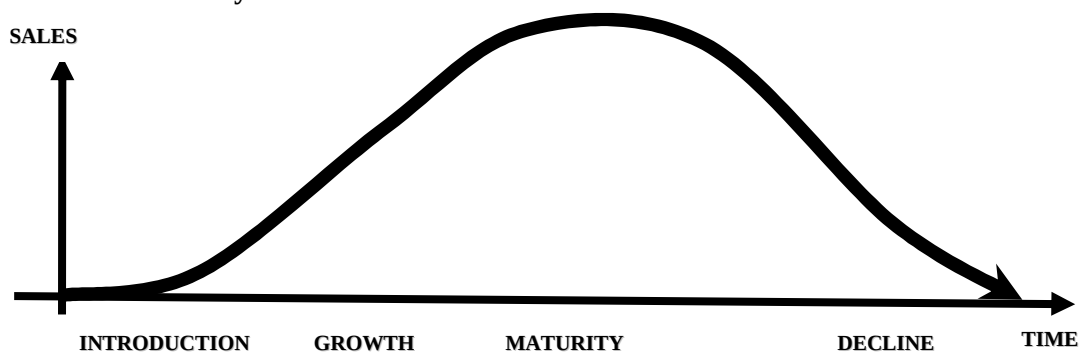
	Export			Retail (Germany)		
	Prices in USD/kg					
Product	conv. *1)*	org. *3)*	Premium [%]	conv. *3)*	org. *3)*	Premium [%]
Atlantic Salmon (fresh, gutted)	2.7 – 3.5	7.0 –11.2	100 - 315	-	-	-
Atlantic Salmon (smoked fillet)	-	-	-	10.8 – 43.3	63.8 – 71.9	47 - 566
Shrimp (BT and WS; IQF, headless)	7.4 (41/50) - 11.7 (21/30) *2)*	10.9 (41/50) - 18.9 (21/30)	47 - 62	17.3	27.0	56

1) Prices from various sources
2) Prices at Tokyo central wholesale market (11 August 2003; http://swr.ucsd.edu/fmd/sunee/twshrimp/tsaug11.htm)
3) Prices at German retail shops and mail order companies

Source: Naturland

The organic market offers a promising future for aquaculture producers who can meet the requirements. However, increased production costs, long conversion periods, lower productivity and the multiplicity of competing private certifying bodies have so far discouraged most producers from turning to organic production. Despite these obstacles, the organic segment has developed at an interesting pace in recent years. There is some controversy about whether the whole aquaculture industry will be forced to go organic, but the general feeling is that this will remain a high-value niche segment.

The Product Life Cycle:



The life cycle for organic aquaculture products is right in its beginning. The products are still in the phase of introduction to the consumers and marketing trials for different product forms are ongoing. Other organic products such as fruits and vegetables, which are the pioneer products of the organic sector, are still in the growth period but sales are slowing down as most potential buyers have now accepted the products. Conventional aquaculture products are already in a more mature stage, as they are widely accepted and prices are balanced by increasing competition in the market.

Today's consumers are complex decision-makers. They take many factors into account when buying food. Is it convenient? What is the packaging like? Is it expensive? Is it healthy? Is it tasty? Does it suit my lifestyle? The organic market is relatively unexploited in terms of product development, and there are many opportunities for new products which can meet consumers' needs. The challenge in marketing organic aquaculture products is to stretch the shape of this life cycle, for example by introducing new species or in providing more value-addition in order to lengthen the growth and maturity period for the products. A key factor for the successful introduction of new products on the market is consumer information and full product description accompanying their launch.

4.2. OVERVIEW OF ORGANIC AQUACULTURE STANDARDS

As regards organic aquaculture, there are currently no commonly accepted regulations at the international level. Certification is carried out mainly based on regulations developed by national or private bodies. The use of different criteria and standards is more an obstacle than an instrument for trade promotion and confidence building vis-à-vis the consumer. Imports can be discriminated against and the role of public and private bodies in the context of standards is not clearly defined.

Currently there are about 20-25 private and non-private certifying bodies for organic aquaculture products, often applying different criteria. The German Federal Ministry for Consumer Protection is lobbying for regulation of organic fish production at the EU level. In 2001, Germany opened the discussion on a common law for aquaculture by presenting a memorandum to the EU-Commission. The discussion is still ongoing, but the will – and the need – for harmonization was expressed on various occasions by the major players involved.

A major issue in the development of harmonized organic aquaculture standards at EU level is the fact that organic production, per se, is the responsibility of the DG Agriculture while aquaculture is the responsibility of the DG Fisheries. Currently, the EU regulations on organic agriculture are undergoing a review and the DG Agriculture is discussing a new Action Plan. The European Commission is committed to include regulations on organic aquaculture in the revised edition of European organic standards. This commitment has already been approved by the European Parliament and the Council of the EU. The provisional time schedule expects the organic aquaculture standards to be ready by the end of 2005/beginning of 2006.

Only a few of the certification bodies listed earlier provide standards on organic aquaculture as they are still in the course of evolution. A government order on organic aquaculture was prepared in **Denmark** in 1998. The Danish Government approved new regulations in 2004 which allow the use of the national label on organic saltwater and freshwater seafood. From April 2004, national regulations

permit the production of organic fish from both marine and fresh water aquaculture. The fish can be labelled with the national red Danish 'Organic'-label. This is the first time that Denmark has formulated such regulations. Examples are a ban on using colorants in the feed and a limit in the use of antibiotics to a single treatment.

France has national organic aquaculture standards since 2000. ECOCERT and Qualité France are the only certifiers for organic fish in France and work with Aquaculture de France (fish farmers association for seabass, turbot, seabream, sturgeon and meagre). The certification guarantees traceability for the whole product chain.

In **Germany** Naturland has been developing detailed standards for carp, trout, salmon, mussels, shrimp and other species since 1995. Some other private organizations are also providing regulations for organic aquaculture (Bioland, Demeter, Biokreis). Up to now, Bioland has only developed standards for carp.

Hungary started the preparation of national standards for organic fish production in 2001, and initiated an exchange of information on organic fish farming standards with Greek, Moldavian and Ukrainian colleagues. The inspection of fish for human consumption is part of Biokontroll's tasks. Currently, two carp farms have been certified and two more will be certified by the end of the year. Draft regulations for organic aquaculture were presented to the **Italian** government in September 2003, but have not been approved yet. The private organization QC&I International Services s.a.s, certified a trout production unit, but according to private regulations.

In **Norway,** after undertaking a two-year experimental project on organic salmon farming, Debio's board of representatives decided in March 1997 that the organization would no longer be involved in organic aquaculture. Debio then made an agreement with KRAV, the Swedish certification body for organic agriculture, and handed their aquaculture related documents over to them, including the Debio standards for organic salmon farming. This enabled KRAV to continue the certification of Norwegian organic aquaculture (fish farming, slaughtering, processing and trading), which had previously been Debio's responsibility. Since 1999, however, Debio has returned to the scene and been involved in developing new standards for organic aquaculture which will be put into practice in January 2001.

Requirements for organic fish breeding were adopted in July 2000 by the **Swiss** certifier BioSuisse. They were developed during two years of cooperation with practicing fish breeders, fish food producers, animal protection organisations and fisheries experts from Switzerland and abroad and were adopted by in July, 2000.

The United Kingdom's Soil Association approved its 'interim' aquaculture standards in 1998. In July 2000 the Organic Aquaculture Standards were published by the three British organic certification bodies working in this sector, namely Soil Association, Food Certification Scotland and Organic Food Federation.

In **Australia** the private National Association for Sustainable Agriculture Australia (NASAA) has been providing organic aquaculture standards since 1999 and the country has national organic aquaculture standards since September 2001.

The Aquaculture Development Branch of the Ministry of Agriculture, Food and Fisheries in **Canada** has recently undertaken research related to organic certification for aquaculture producers. The aim is to facilitate constructive dialogue and cooperation between interested parties in formulating standards that will create opportunities for the development of an organic aquaculture industry in British Columbia, maintain the integrity of organic standards and develop alternative aquaculture products for consumers. It is expected that these standards will provide a benchmark both for the development of organic aquaculture operations and the conversion of conventional operations to organic production.

Independent, third-party certification of organic salmon production will be provided under the auspices of the British Columbia Certified Organic Program administered by the Certified Organic

Associations of British Columbia (COABC). COABC's Aquaculture Standard Review subcommittee is deliberating on a number of issues, including whether to recommend that COABC should formally commit itself to the development of organic aquaculture standards. A draft version has already been developed.

Members of the Pacific Organic Seafood Association (POSA) also raise salmon in a healthy, safe and environmentally friendly way. Their standards meet or exceed those that have been set by the International Federation of Organic Agriculture Movements (IFOAM) and are based on a review of standards that have been accepted by 14 global organic standard setting organizations for the organic rearing of aquatic species. In addition to these global standards POSA members have additional standards, which address local social and ecological issues.

In the **Far East** the **Chinese** guidelines issued by the National Accreditation Board include a chapter on organic aquaculture production standards. In **Thailand,** ACT is a private organic aquaculture certifier for shrimp. According to Fish Farming International[30], the **Philippines** intend to introduce a national label in order to increase the marketability of their aquaculture products. The label would be given to products complying with international standards. **Vietnam** prepared new regulations on organic aquaculture in 2001.

At the international level, draft standards for organic aquaculture were adopted by **IFOAM** in 2000 but have yet to be adopted as full standards. IFOAM's Organic Aquaculture Group was formalized in February 2004.

Without pretending to be exhaustive, the following table contains an overview of public and private organizations that have developed standards on organic aquaculture:

Table 9: Overview on organic aquaculture standards

EUROPE	**Biosuisse (Switzerland)**	**Trout**
	Debio (Norway)	**Salmon, trout**
	Ernte (Austria)	**Carp, trout**
	KRAV (Sweden)	**Salmon, trout, arctic charr**
	Bioland, Biokreis (Germany)	**Carp**
	Naturland (Germany)	**Carp/tench, salmon, trout, mussel, shrimp**
	Soil Association (UK)	**Salmon, trout**
	Food Certification Scotland (UK)	
	Organic Food Federation (UK)	
	Irish Organic Farmer and Grower	
	TÚN (Iceland)	**Salmon, trout, arctic charr**
	QC&I (Italy)	**Trout, seabass, seabream**
	AIAB (Italy)	**Trout, salmon, carp, cat fish, eel,**
	National Red Label (Denmark)	**Saltwater/freshwater fish**
OCEANIA	**BIOGRO (New Zealand)**	**Salmon, crayfish, oysters, seaweed**
	ACO/BFA(Australia)	
	NASAA (Australia)	
ASIA	**ACT (Japan)**	**Shrimp**
NORTH AMERICA	**FOG (USA)**	
	FVO (USA)	
	NOFA (USA)	
CANADA	**COABC (Canada) - Draft**	
INTERNATIONAL	**IFOAM -Draft**	

[30] Fish Farming International, 01/2004 Issue

4.3. ORGANIC AQUACULTURE PRODUCTION BY SPECIES

Arctic Char (***Salvelinus alpinus***)
About 40 mt of organic arctic char are produced in Norway. In Iceland, the production of organic char is under consideration. Some production also takes place in Austria, with farm gate prices at about 7-8 €/kg.

Carp (***Cyprinus* spp.**)
Carp, as a herbivorous species, is considered ideal for organic aquaculture as it doesn't need any fishmeal or fish oil in its feed. Where carp is reared in earthen ponds in a virtually natural environment there is large potential for conversion to organic production. Organically produced carp is harvested in late autumn, when the ponds are low in nutrients and the water is clean from algae.

In Austria 10 percent (equivalent to 300 ha) of the area used for carp production is already dedicated to organic aquaculture and should be further extended in the coming years. Austria's twelve Bio Ernte organic carp breeders farm 170 hectares of ponds, mainly in Waldviertel. Organic fish are also found in Southern Styria and in Carinthia. The fish themselves must find at least 50 per cent of their food needs in the pond. Insect larva, snails, worms, plankton and other protein-rich creatures are put out to 'pasture' on an area of 20 m².

Only Austrian organic corn is used as supplementary feed. Chemical growth stimulators, hormones or antibiotics are strictly prohibited. According to Bio Ernte the selling prices for organic carp are 10 to 30 percent above those for conventional fish The average farm gate prices for organic carp in Austria, Germany and Switzerland are 3.0-3.5 €/kg.

Some production also takes place in Hungary. There are two certified farms with a production area of about 120 ha. An additional 4,600 ha will be ready for certification by the end of 2004. As for other organic aquaculture species, production is often limited by the high cost and inadequate availability of organic feed. According to the Hungarian Research Institute for Fisheries, Aquaculture and Irrigation (HAKI), organic carp has a high profit margin potential as organic production costs are only 7 percent higher than conventional ones while the retail price is 20-200 percent higher. In 2001, carp production programmes and standards were prepared by the following private organic certifiers: Ernte (Austria), Bioland/Demeter/Biokreis, (Germany) and Biokontrol (Hungary). Naturland produced their standards in 1995.

Cod (***Gadus* spp.**)
Organic cod farming, as is the case for cod farming in general, still does not exist at commercial scale. However, Johnson Seafarms in Shetland is highly interested in setting up an organic cod farm and is currently involved in discussions with the Soil Association and with feed manufacturer Biomar UK, in order to develop organic cod farming standards and appropriate feed.

Crayfish (***Astacus* spp.**)
New Zealand Clearwater Crayfish Ltd. is the only company producing organic crayfish so far. Production has been certified by AgriQuality (CERTNZ) since December 2001. The New Zealand certifier BioGro is also looking at the possibility of certifying organic crayfish.

Mussels (***Mytilus* spp.**)
Ireland has been producing organic blue mussels since 1999, certified by Naturland. New Zealand obtained certification for organic green mussels in 2004. The Sealord Group was the first producer worldwide to receive organic certification for green mussels in January of that year. As the biggest processor and marketer of New Zealand green mussels Sealord processes about 18,000 mt a year of which 20 percent are organic. Organic production should increase in the future to account for half of the total output. The certifier is New Zealand's organic food certifier Bio-Gro and the product's expected value increase, due to the organic label, is estimated at about 30 percent. Organic green mussels are distributed through retailers with an organic focus and those at the top end of the

conventional market. Export markets are Europe, principally the United Kingdom, and the United States.

Oysters (***Crassostrea gigas***)
The New Zealand certifier BioGro is monitoring the production of organic oysters. Some US producers also offer this product, but without any third party certification (American Mussel Harvesters, Inc states: 'The California Organic Foods Act of 1990 defines organic foods as safe, nutritious, unadulterated, with no artificial chemicals or pesticides, no genetically modified organisms and aware of animal welfare. There is little available information on registering shellfish as naturally organic. Because of this, we have taken the bold, yet logical, step of labelling our shellfish as naturally organic.').

Paiche Fish (***Arapaima gigas***)
In Peru, one paiche fish farming project is in the process of certification.

Pangasius/Basa (***Pangasius***)
There is some interest in organic pangasius from the Swiss retailer COOP. The possibilities for production of organic basa fish/ Mekong basa (Pangasius bocourti) will be evaluated in Vietnam by SIPPO and VASEP, the Vietnam Association of Seafood Exporters and Producers. Furthermore, Naturland is working on an arapaima (Pangasius gigs) project in Peru.

Pike/Pike Perch (***Esox lucius/Stizostedion lucioperca***)
These species are usually farmed in combination with carp. Currently, organic farming takes place in Austria and Germany.

Freshwater Prawn (***Macrobrachium rosenbergii***)
SIPPO in collaboration with VASEP plans to certify freshwater prawns in Vietnam in the near future.

Salmon (***Salmo salar***)
As noted earlier, organic salmon is by far the most important species on the market at the moment in terms of volume. According to the Irish Salmon Producers Group, the production share of organic salmon in Ireland will reach 10 percent by 2010. According to other sources[31], it already represents about 14.4 percent. An article published by Intrafish in February 2004 even indicates a share of 20 percent.

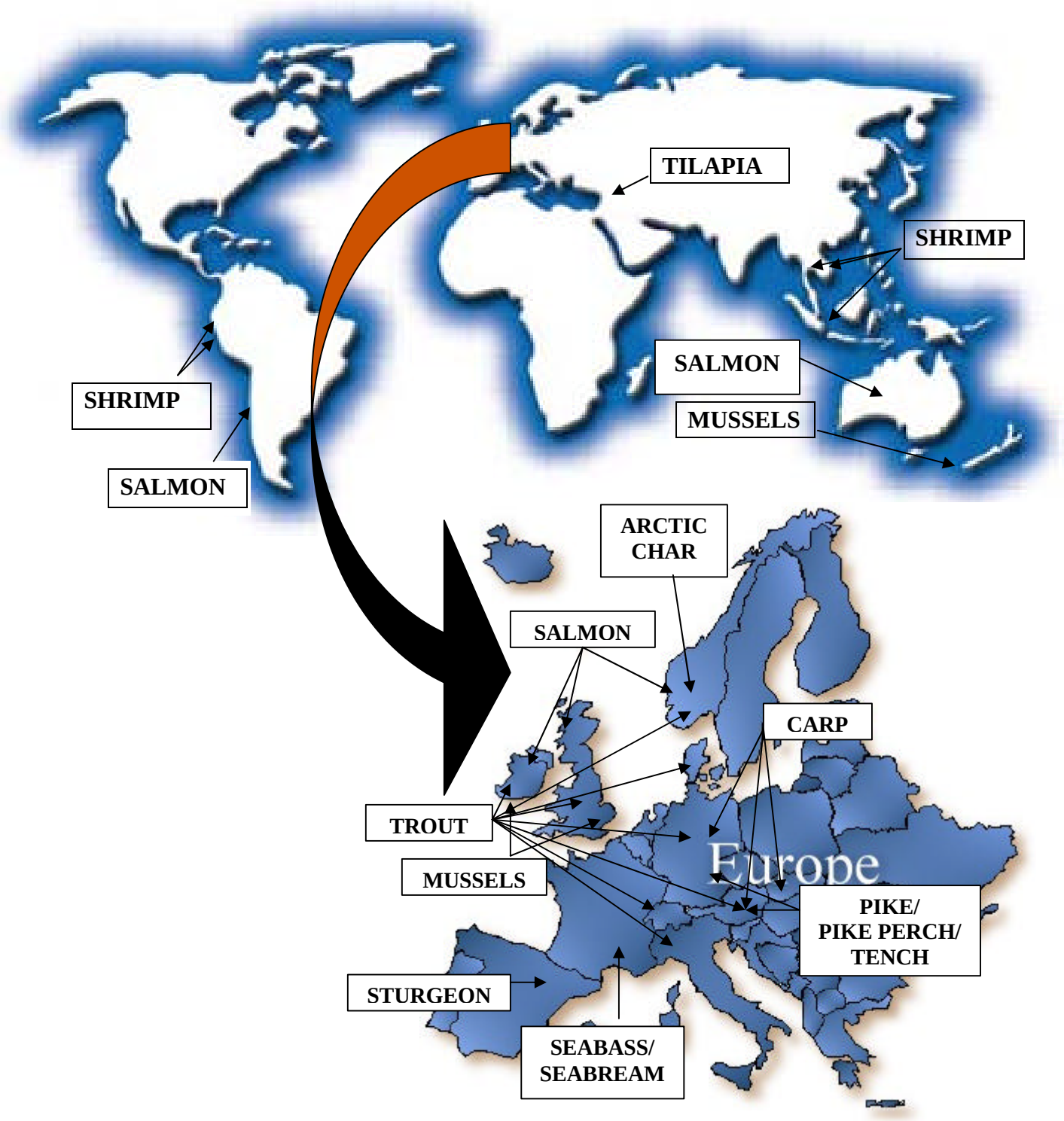
In the UK market, the value of organic salmon sales increased by 33 percent to £ 5 million in 2003. According to British salmon producers[32], organic salmon currently represents about 2 percent of total domestic salmon production in UK, which represents about 3 000 -3 500 mt per year in volume. In comparison, 600 000 mt of conventional salmon are produced annually in Northern Europe.

Recent negative media headlines on conventionally farmed salmon have had a positive impact on sales of organic salmon in UK. As reported by The Observer, orders for organically produced salmon have risen by at least 10 percent since a report on contaminated salmon was published in the magazine Science.

Stocking densities used for organically farmed salmon are less than half the levels used in conventional farming. In UK, organic production costs about 30 percent more than conventional farming. The organic salmon is sold at the age of 32 month (usually at 24 month for conventional). The density in the cages is 5-10 kg/m³ (compared to traditionally 20-30 kg/m³ for conventional). Therefore the final product – fresh or smoked – often costs twice as much as the conventional one.

[31] Naturland, *Organic Aquaculture – Completing the first decade*
[32] Kahn S., 18/01/2004, *Salmon farms urged to rear organic fish*, the Observer

Organic Seafood Production Worldwide:



According to IntraFish (04/2004), two fish feed manufacturers in the UK, EWOS and Skretting have started production of organic feed for salmonids. According to the UK-based Soil Association standards, these feeds have no more than 28 percent of oil and at least 50 percent of the fish-derived compound originates from by-products of wild-caught fish destined for human consumption. The Soil Association allows only crushed shrimp shell to be used for feed pigmentation while other certifiers such as Naturland are less strict, also allowing the use of the yeast-based pigment phaffia.

Some 2 600 tonnes per year (about half of global production) of organic salmon are produced in Ireland. A first organic Irish salmon, farmed at Mannin Bay, recently obtained certification under the

strict French national 'AB' standards. It is traded in France under the brand 'Nature Océan'. A second Irish farm will receive 'AB' certification by the end of 2004. Clare Island Sea Farm, described in detail below, is also certified by several bodies.

The European wholesale price for fresh organic salmon is about 6.00-7.50 €/kg, but it can reach up to 13.00 €/kg at the retail level. Conventional fresh salmon prices varied between 3.00 and 4.40 €/kg in 2003 (Rungis Wholesale market, France). Smoked organic salmon fetches prices of 50-60 €/kg.

Organic salmon is available on the German market under the "Teichgut" brand. The Teichgut organic salmon product range includes frozen fillets, frozen breaded pieces, smoked and 'gravet' (marinated) salmon slices.

The most important French region for salmonids aquaculture, Aquitaine, is preparing pilot projects on organic aquaculture and is promoting the conversion to organic production methods.

Some organic salmon (20 mt annually) is produced in Norway.

The Canadian company Heritage Salmon owns the Fiordo Blanco company in Chile, which produces organic salmon certified by Naturland. The first harvest will be available on the Canadian and US market later this year. The production volume planned for the first year is 1 000 mt and will be sold in the form of fresh fillets with a price premium of 30 to 50 percent.

One farm in New Zealand, Ormond Aquaculture Limited, obtained certification for its salmon culture according to CERTNZ standards.

To date, salmon production programmes and standards have been prepared by the following private organic certifiers: BioSuisse (Switzerland), KRAV (Sweden), Naturland (Germany) – since 1996, the Soil Association (UK), TÚN (Iceland), ACT (Thailand), BioGro (New Zealand), AIAB (Italy).

Clare Island Sea Farm

The salmon farm on Clare Island situated on the west coast of Ireland is one of the major success stories of organic aquaculture. The salmon is farmed in accordance with organic farming standards established by Naturland Verband (Germany), the Irish Organic Farmers and Growers Association (IOFGA), which is recognised by the Soil Association in UK and ECOCERT International (France).

The Director, David Baird, has been in the salmon farming business for 25 years and confirms the sustainability of the product from the egg to the final product offered to the consumer. The smolts from organic parents are reared in a certified hatchery. At the age of 15 months they are flown by helicopter to Clare Island. When they reach the weight of one kilo they are transferred to the main 23 000 m³ cages. The salmon remain in the cages until the age of 32 months (traditional farming systems: 24 months). The ten cages, containing 50 000 salmon each, are placed at a depth of 15 m at 5-7 km distance from the coast. The natural currents of the Atlantic keep the salmon in constant movement and avoid unnecessary fattening. Compared to the conventional 20-30kg/m³, the stocking density at Clare Island reaches only 5-10kg/m³. The salmon is fed by hand twice per day. This highly labour intensive activity requires 38 workers – instead of two on a conventional farm using automatic grain dispensers for feeding. The feed consists of 70 percent fishmeal and oil and 30 percent organic cereals. This incurs additional costs of 30-40 percent compared to conventional cereals. In fact, the price of gutted organic salmon on the French market is 80-100 percent higher than that for conventional salmon. The processing is fast in order to ensure a fresh product. Slaughtered at 5:00 on Monday morning, the salmon is gutted, cleaned and packed by Tuesday afternoon, to arrive in France on Wednesday morning and redy on the shelf on Wednesday afternoon. In 2002, 35 percent of the total production of 1,400 mt was exported to France and 40 percent to Germany.
Cont. next page

Clare Island Sea Farm cont.
In France, 70 percent of imported salmon is given added value through smoking. The remaining 30 percent is sold fresh in major supermarket chains like Carrefour and Leclerc. The production target for 2004 is 2,000 mt, and then to 2,500 mt in 2005. This should be possible thanks to a new production site in Mannin bay, which is already certified for the German market and should produce 250 mt in 2004. Clare Island together with twelve other Irish producers is part of the Irish Seafood Producers Group (ISPG) founded in 1985. This cooperative produces 70 percent (18,000 mt) of Irish salmon annually and helps its members to keep the logistical, distribution and marketing costs at an acceptable level. The largest farmed salmon producer in the world, Nutreco, is expected to take over Clare Island Farm, which is a further indication of the growing interest of conventional producers to enter organic aquaculture.

Scallops (***Pecten* spp.***)*
The German association Naturland has just started an organic scallop project in Peru.

Seabream/Seabass (*Sparus aurata* /*Dicentrarchus labrax*)
In 2001 seabream and seabass production programmes and standards were prepared in Italy by QC&I. Seabream and seabass are also produced in the region of Provence in France and have been available on the market since 2003. Production is exported to Switzerland and sold on the domestic market in Paris and to local restaurants. Annual production can not exceed 100 mt due to the limit imposed by the organic certifier. In 2003, conventional seabream fetched 12 € per kilo.

With organic certification, the price is anticipated to increase to 15-16 € per kilo. Provence Aquaculture was the first farm to start organic production of Mediterranean species of seabream and seabass in July 2002 with AB certification. The French producer association Cannes Aquaculture produces seabass, croaker and snapper, also certified by AB.

Seaweeds/Algae
Seaweeds and algae can be used for a whole range of purposes: Thalassotherapy, direct human consumption, integrators, food industry, cosmetic/pharmaceutical products, fertilizer and animal feed. In 2003, the annual production value reached US$ 6 billion (including US$ 5 billion for food products for human consumption).

One example of seaweed products is Spirulina, a freshwater micro organism from the Equatorial region used as a food supplement and containing more than 100 nutrients and trace elements. BioSpirulina, certified since November 2003 by Naturland, is cultivated in Asia without any additional inorganic mineral nutrient sources. It is sold as pills in different quantities from 100 (€ 11.75) to 1,000 pieces (€ 78.95) or as powder (125 g at € 23.90, 1,000 gram at € 129.95).

Seaweeds such as Kombu have many positive nutritional aspects including high vegetable protein contents, fats with high fibre content and richness in vitamins and minerals. The alkalinity of seaweeds represents a valid opportunity to balance the mainly acid diet of the Western world. The cultivation of seaweed is increasing, mainly in the traditional producer countries in Asia, but also in America and Europe. Seaweed cultivation can be combined with shrimp or some other fish production.

In 1999 seaweed production programmes and standards were prepared by the private organic certifiers: TÚN (Iceland) and BioGro (New Zealand). The introduction of a label for controlled biological cosmetics by the German BDHI is a first step towards standardization of that segment of the market.

Shrimp (***Penaeus* spp**.)
Particularly sensitive issues in shrimp farming concern the management of mangrove forests, the use of medicines/antibiotics, feed, hatchery management and the social context of shrimp farming.

According to some producers, organic shrimp is about 30 percent more expensive to farm than conventional. This is mostly due to the higher costs for organic feed, which is difficult to source as most of the organic production is destined for human consumption. In addition the shrimp are raised with a density of only 2-3 larvae per square metre resulting in relatively low productivity (150kg/hectare/year).

Naturland has registered shrimp farms in Ecuador (5), Peru (1), Vietnam (1,022 enterprises with a total of 6 475 ha), Java/Indonesia (156 enterprises, 1 481 ha), Brazil, Colombia and Thailand. Organic shrimp have been exported to the United Kingdom since 2001, but are now available also in Germany, Switzerland, Sweden, Austria and France.

In 2001 about 500 mt of organic shrimp (mainly black tiger, but also white shrimp and banana shrimp) were produced by 1 022 farms linked to a state owned Vietnamese enterprise assisted by the Swiss Import Promotion Programme (SIPPO) and described in more detail below. Production was planned to reach about 2 000 mt per year by 2002. The Swiss retail chain COOP imported 40 mt of organic shrimp for a total value of 730 000 US$ in the biennium 2001/2002.

Swiss Import Promotion Programme (SIPPO)

SIPPO is the economic-development instrument of the Swiss State Secretariat for Economic Affairs, which assists small and medium-sized companies in developing countries and countries in transition to improve their market access to Switzerland and the European Union. Since 1999 SIPPO is coordinating an organic shrimp farming project in the Vietnamese Province of Ca Mau in close collaboration with local counterparts. 1 022 family run farms linked to the state owned ‘Enterprise 184’ are producing black tiger shrimp according to Naturland standards in a mangrove protection area. The project is also associated with the public mangrove reforestation programme in the area. The shrimp is farmed at a density of 2-3 postlarvea per square metre and nourished with natural food produced by the mangrove forests. The output of the ponds is about 150-200 kg/ha/year. From three to six people work on each farm. ‘Enterprise 184’ functions as the central storage and distribution station. The 20 percent price premium is divided between farmers, wholesalers and processors. The farmers obtain a larger share as they also have to cover major costs, especially with regard to the annual certification fee. A part of the income is deposited in a fund for future organic aquaculture projects. Wholesalers and processors have been trained by SIPPO experts in order to guarantee the respect of Naturland’s guidelines along the entire production chain. The German institute IMO has monitored the compliance and in 2001 certification was obtained by all actors involved. SIPPO has also arranged contacts with Swiss buyers. COOP Switzerland became one of the most important clients and has been convinced to convert its entire shrimp range to organic. Since August 2003, the Swiss organic label BioSuisse, which is highly respected by Swiss consumers, certified 400 of ‘Enterprise 184’ farms and monitoring of a further number is ongoing. In 2003, importers from other European countries, namely from UK, France and Belgium, visited ‘Enterprise 184’. The Vietnamese Ministry of Fishery has shown a high interest in the venture and wishes to promote organic aquaculture in other regions.

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)

GTZ is an international cooperation organization carrying out projects for sustainable development mainly on behalf of the German government. About 2 700 development projects worldwide are currently being supported. A GTZ project in Ecuador has now successfully introduced the standards on organic shrimp production developed by the German association Naturland.The project focused on a participatory approach, involvement of expertise and the media, generation of awareness on biodiversity, introduction of new standards in the local industry, income/employment generation and assistance to small scale producers. Since 2001, five companies have been certified and are successfully exporting organic white shrimp to the European market. The certification according to Naturland standards is provided by an accredited independent third party certification body. Main markets for the Ecuadorian organic shrimp are Germany, Switzerland, Sweden, Austria and France. One producer in particular, Expalsa, has introduced a new company philosophy involving social aspects. Staff is trained on ecological, labour and economic issues. The local communities receive active support. In particular, housing infrastructures and education for street children are provided in order to facilitate their reintegration into society.

ATINA, a subsidiary of ATJ Japan, produces organic black tiger shrimp in Indonesia using traditional rearing methods. 256 farmers with more than 2 500 ha of pond area are currently participating in this organic aquaculture project. The company, which is committed to 'people-to-people trade', sells ecologically sustainable products according to ethical trade values.

Organic production started in 2000 and was certified by Naturland in 2002. The extensive production, in line with traditional methods used for centuries, also includes social benefits, like 'buri': the local custom of communal work, which provides seasonal employment and facilitates harmonious and cooperative human relations in the local community.

Biocentinela and Expalsa, mentioned above, are the two major organic shrimp producers in Ecuador. Expalsa Exportadora de Alimentos SA, the leading producer, located at Guayaquil, introduced its organic Litopenaeus vannamei production in 2003, under the brand 'Organic Wonder'.

The production facilities are on a certified site of 512 hectares, and include a feed plant, a hatchery and a processing plant. The organic production, according to Naturland standards, represents about ten percent of Expalsa's total shrimp production and is exported entirely to Europe. BioSuisse certified the family owned company's production in 2003 and UKROFS (United Kingdom Register of Organic Food Standards) is also in the process of monitoring production. Expalsa has a current production of 40 mt of organic shrimp per month, which should expand to 400 mt per month in 2004.

The Ecuador-Peru Organic Shrimp Producers and Exporters Association, currently represented by the Ecuadorian company Biocentinela and the Peruvian Natural Farm, has a production capacity of 500 mt per year. Biocentinela has a long experience in conventional shrimp farming. However its entire production was converted to organic by 2001, when it was officially registered by Naturland as conforming to its standards and requirements for organic shrimp production.

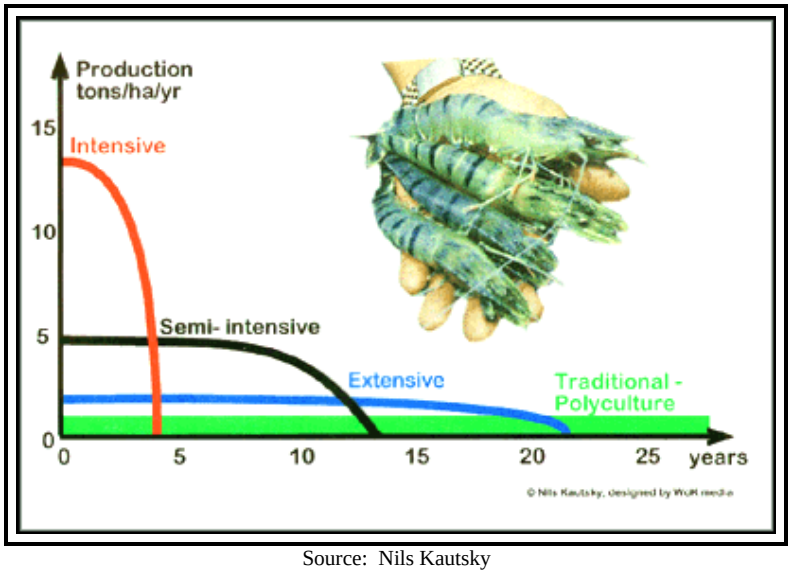
According to Mr. Javier Barragan, the company's founder, the conversion was triggered off by the outbreak of White Spot Disease in Ecuadorian shrimp farms some years ago. Unlike other farmers, Biocentinela refused to resolve the problem with heavy use of antibiotics and started to introduce a production system based on the principles of natural farming developed by Mokichi Okada (1882-1955), a Japanese jeweller who became a spiritual leader and a farming pioneer.

Biocentinela has more than doubled its production volume in the last two years, increasing from 7 mt per month in 2002 to 15 mt per month in 2004. The shrimp processing takes place in the accredited

Expalsa processing plant. Most of the production is exported to the European market, in particular to UK and Switzerland.
In total, there are nine certified shrimp facilities (hatchery, farms, processing plant and feed plant) in Latin America at present. Of these the Ecuadorian enterprise Camaronera Bahia was the world's first certified shrimp farm (Naturland certification).

The United States, Europe and Japan are the main markets for shrimp, however the share of organic shrimps in total shrimp imports in 2002 was only 0.10 percent[33].

Chart 18. Shrimp Production Methods and their estimated lifespan



Source: Nils Kautsky

Tench (***Tinca tinca***)
Some organic tench is farmed in Austria and Germany.

Tilapia (***Oreochromis* spp.**)
The Kibbutz Geva Organic Fish Project established in Israel in 1999, produces frozen organic tilapia fillets as well as 'oven ready' tilapia products certified by Naturland. About 40 mt of tilapia fillets were exported to the EU in 2003, while domestic consumption accounted for only five mt.

Trout (***Oncorhynchus mykiss***)
Up to now mainly rainbow trout, originating from North America, has been raised organically, but the European brown trout is also increasingly available. Austrian organic trout producers intend to increase their production, currently less than 10 mt, up to 30-50 mt per annum.

In France, about 80 mt of ECOCERT certified organic rainbow trout are produced annually by 'La Ferme Aquacole du Planturel', using a stocking density of 35kg/m^3 in a 600 ha lake during a rearing cycle two months longer than for a conventional product. Compared to conventionally produced product, the market price for organic is about 30 percent higher. There are other organic producers in France and about 30 mt of brown trout have been farmed.

The Fish Farm Rameil in Lindlar was the first certified organic fish producer in Germany in the year 2000. Today, it produces about 160 000 trout per year, which – together with trout from five other German organic producers – are marketed under the 'Teichgut' label. Rameil produces between 35 and 50 mt of fish annually, including trout, carp, eel, and tench. The

[33] BioCentinela SA, 'Organic Aquaculture and Sea Farming' Conference, Vietnam, 2004

trout is raised in ponds with natural bottoms and with a special feed, all according to organic guidelines.

Ireland produces about 120 mt of organic trout per year and UK production is 500 mt.. Soil Association reports that the farm-gate value of UK organic trout production increased by 20 percent in 2003.

In the Northern Italian Province of Friuli, trout is produced organically and exported to Germany. The ponds receive fresh clear water from the Dolomite Mountains close by. The trout is smoked using various types of local wood. It is also marketed cooked and marinated in herbs. Other farming sites in Sardinia and Calabria are now under consideration for certification.

The Spanish company Sierra Nevada offers organic trout and a whole range of value-added seafood products. In 2003, Spain produced 220 mt of rainbow trout and 15-20 mt of brown trout.

There are eleven certified trout farms in Switzerland. that produced about 220 mt in 2003.

Norway produced about 3 mt of brown trout in 2003 and Seafood International reported in its June 2003 issue, that four trout farms in Denmark have converted to organic production methods. The Danish production will be sold mainly in the German market.

Iran has shown interest in organic trout farming, but has yet to implement production.

Prices for organic trout on the European market vary from 7 to 8 €/kg farm gate price for whole trout and 12 €/kg for gutted trout.

In 2001 trout production programmes and standards were prepared by the following private organic certifiers: BioSuisse (Switzerland), Debio (Norway), Ernte (Austria), KRAV (Sweden), Soil Association (UK), Tún (Iceland), QC&I (Italy). Naturland (Germany) prepared its production programmes and standards in 2000.

Sturgeon (***Acipenser* spp.**)

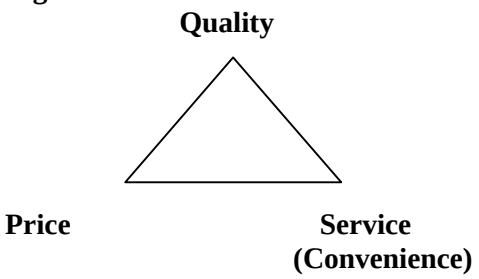
The Spanish company Piscifactoría de Sierra Nevada S.L., based in Riofrío, was founded in 1956 and converted its entire production to organic in 1999, with the collaboration of various scientists from private companies and universities. It is the only company in the world, so far, producing certified organic caviar and sturgeon. Certification was obtained from the Andalusian Regional Committee of Organic Agriculture (CAAE). Sturgeon production has now reached 200 mt a year. Gutted organic sturgeon is offered at 25 €/kg at the retail level, while the smoked product sells for 40 €/kg and 60 grams of caviar for € 93.

4.4. PROCESSING OF ORGANIC AQUACULTURE PRODUCTS

The organic market is relatively underdeveloped in terms of processed value-added products. This being said, organic aquaculture products, per se, are considered to be value-added by definition, as they incorporate additional quality values compared to conventional aquaculture products.

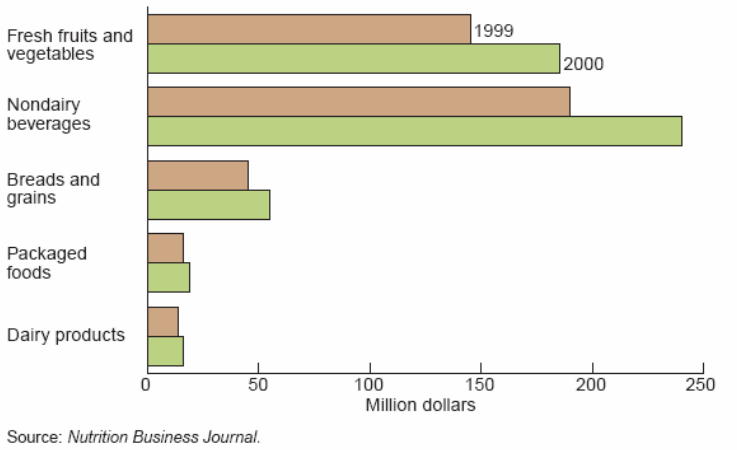
The production, processing and handling, based on stringent quality and food safety standards, already form a basis for higher prices. However, higher retail prices of the final product do not necessarily translate into higher profit margins at any stage of the distribution chain in view, as stated, of the higher production costs involved.

The customer value triangle:



The chart below shows the value of some processed organic products in the US market in 1999 and 2000.

Chart 19. Sales of Selected Processed Organic Foods (USA)



As discussed earlier, consumption patterns in Western societies are changing towards more ready-to-eat and other convenience products. Thus in general, the demand for value-added fishery products in Europe is increasing. The profile of 'organic' consumers is also undergoing a transformation as more and well-educated, middle-high income members of society are attracted by these products. This target group is willing to accept a price premium of about 20-40 percent in order to satisfy their needs for high quality convenience products..

The organic market is relatively unexploited in terms of product development and there are many opportunities to influence the complex decision making process of consumers. These include opportunities for value-added fishery products from developing countries.

Shrimp offer the best opportunities for processors in these countries. Almost all European countries reprocess what is imported as a basic commodity, into smaller consumer packs. In addition, in recent years, more and more value-added shrimp products have been put on the market and have had a good acceptance, such as IQF shell-on or peeled shrimp skewers. In this respect the EU market is becoming increasingly flexible and these products will expand their role.

This being said, a major concern for value-added organic seafood production in developing countries is the lack of a common standard on organic aquaculture production. The risk is to prepare an organic value added product – at higher costs– which is then not recognized as such on the export market. In which case the price finally obtained will not be able to cover all production costs. Furthermore, the cost the high-tech equipment needed for such processing may be prohibitive for local producers, even though labour costs are generally low.

Western consumers are increasingly receptive to products from 'exotic' fish species. Therefore, developing countries should concentrate on the production of species where they have a comparative

advantage, such as tropical shrimp or tilapia. Value-addition could be generated through the combination of seafood with local ethnic ingredients, like spices, for example.

Functional foods are defined as 'foods that, by virtue of physiologically active components, provide benefits beyond basic nutrition and may prevent disease or promote health' as defined by the Director of the University of Illinois Foods for Health Program. Examples of functional foods are low calorie items, high-fibre foods, low-carbohydrate foods, soy based products, low sodium products, and supplement-enhanced foods.

Processed aquaculture products that can combine the attributes of innovation, taste, health and convenience will have strong opportunities.Effective imagery and branding is also vital for attracting new consumers.

4.5. ORGANIC AQUACULTURE IN DEVELOPING COUNTRIES

As stated earlier, due to depleting wild fish stocks, future fish supplies will come primarily from aquaculture. Already 90 percent of the world's aquaculture production takes place in developing countries, especially in Asia, and increased production will go hand in hand with increased international trade.

Organic production is certainly not the solution for economic development and food security in developing countries, but it might contribute to it. Organic production means independence from foreign suppliers of fertilizers and antibiotics and leads subsequently to the empowerment of local communities.

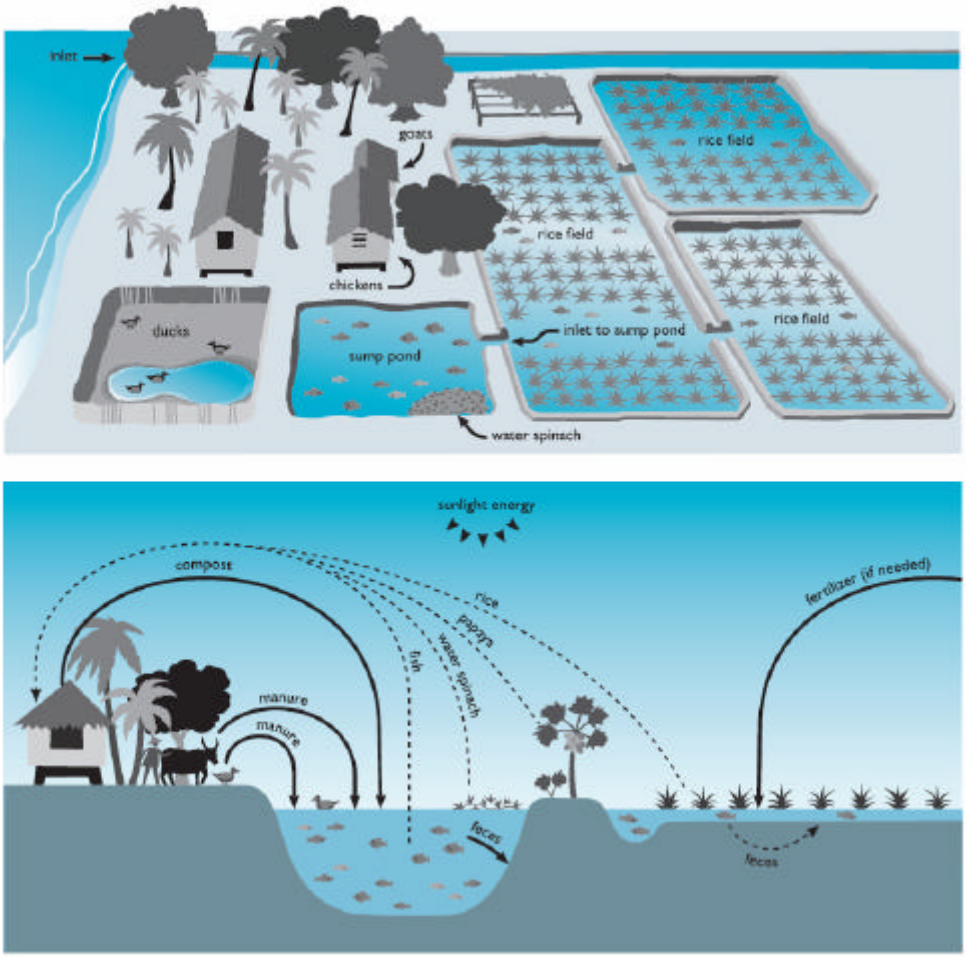
Up to now, organic production has often been associated with local production and local markets. But with improving transport systems and storage facilities, this perception loses credibility – especially for tropical products not cultivable in the Northern hemisphere. Furthermore, consumers of organic products are often not only aware of environmental issues but also care about socio-economic aspects of trade. Fair trade and global social relationships are an important link between worldwide food security and further development of organic production.

The organic movement's values are ethically compatible with fair trade involving developing countries, even though long distance transport has to be considered critically under the profile of efficient and ecological treatment of energy resources.

The combination of fair trade and organic products has proven to be particularly successful in supermarkets and there now seems to be a more general convergence between the two (e.g. in the coffee market). However, fair trade seafood products – and in particular organic seafood products - are still in a very early stage.

As has been said, developing countries have a high potential for production and export of organic products – especially for products and species where they have a comparative advantage. For example the commonly highly labour intensive production methods are more sustainable in these countries. However in order to be competitive and to meet the certification requirements and safety standards in this growing market segment, small producers would need access to information on production procedures, post-harvest handling and marketing. Often the adopted production systems already comply with organic principles, but in an informal, not certified way.

International trade helps these countries to earn important foreign currency, but production should not concentrate solely on external markets to avoid the risk of a 'green colonization' and price increases in the domestic markets.



Source: FAO

Innovative integrated fish farming systems such as the combination of rice fields and organic aquaculture (paddy fish farming) could be an opportunity for Asian small scale farmers to diversify their income and link production cycles in an environmentally sustainable way. The species traditionally used for paddy fish farming is carp, but tilapia is also suitable. This system allows polyculture by exploiting the different layers of the paddy field.

Other integrated systems, such as the mulberry-silkworm-fishpond system have been used for centuries by small-scale farmers. The leaves of the trees growing at the edge of the fish ponds provide the feed for the silkworms. The excreta and pupae of the silkworms are used as inputs for fish ponds and the pond mud is recycled as fertilizer for the mulberry trees. Fish-cum-pig farming is another traditional integrated farming system developed by Chinese farmers and successfully exported to other Asian countries including Thailand, Malaysia and Singapore. The same can be said for the combination of fish and duck farming.

In Malawi, the WorldFish Center (formerly known as ICLARM, the Institute for research on conservation and sustainable use of living aquatic resources) has implemented integrated pond fish culture as a low input farm system. About 2,000 farmers with an average farm size of 1.5 ha are participating in this project. The average production of fish has steadily increased, reaching 1,500 kg/ha.

4.6. MAJOR CONSTRAINTS FOR ORGANIC AQUACULTURE PRODUCTION

Organic Marketing Initiatives and Rural Development (OMIaRD) is a research project with a duration of 38 months starting January 2001, funded by the European Union. As the first major research project to link the two key EU policy areas of sustainable agriculture and rural development, OMIaRD aims to examine all aspects of the marketing of organic food in Europe, with a focus on rural development.

OMIaRD sent three subsequent questionnaires including feedback on the results of the previous round to experts on organic food marketing and rural development from a variety of occupational backgrounds in 18 European countries.

The issue of constraints to organic market development had the following outcome: 'Fragmented and underdeveloped market' and 'lack of marketing know-how' received high scores from a list of possible constraints for the development of supply, with increasing importance in the 3rd round. In that round more than 70 of experts also considered 'poor cooperation and communication' and 'low levels of farm gate premiums' to be important constraints, whereas 'lack of supermarket involvement' and 'competition from non-organic alternatives' were not seen as important. 'High consumer price', 'poor availability of organic products', 'lack of consumer information and awareness' and 'poor product presentation' were considered important by more than two thirds of the respondents, whereas 'competition from near organic alternatives' and 'lack of credibility of the certification systems' were not considered important.

With regard to organic aquaculture, some other specific concerns have emerged. It is certain that a major constraint to further growth of organic aquaculture production is the absence of a universally accepted standard. Furthermore, organic farming of carnivorous species raises the question of correct feed. Should fishmeal and fish oil be part of their diet? Some German organic associations, namely Biokreis, Demeter and Bioland, have refused to include farmed carnivorous fish in their certification credentials

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The relatively long conversion time and corresponding financial losses incurred until organic production takes over, are important aspects to be kept in mind. The need for financial support until conventional farming methods are completely converted may pose a problem especially in developing countries. With regard to agriculture, the EU provides up to five years of financial support for conversion to organic production in its member countries.

With an eventual increase in supply of organic aquaculture products, the current price premium is likely to decline in the future. This aspect has to be considered in any decision to convert to or set up organic production processes. Production has to be economically sustainable even with declining price levels.

As far as mariculture is concerned, some other aspects have to be taken into consideration. The vulnerability of net-cages in the marine environment is highlighted amongst other things by the risk of escapes and the impossibility to guarantee the water quality.

An important issue for the future is also the certification of wild fish, which is currently undertaken exclusively by the Marine Stewardship Council (MSC).

In developing countries there are some additional constraints. As organic production seems fairly similar to many traditional systems, conversion of these systems and subsequent certification may appear to be an obvious thing to aspire to. However, certification is costly and for subsistence farmers with small marketable surpluses, it may not be economically feasible.

The adoption of organic farming techniques may also be constrained by the lack of know-how and the absence of training and extension facilities. The length of the conversion period is also a barrier, as usually products cannot be sold as organic during this period. However organic production standards and certification requirements don't necessarily have to become trade barriers for producers in developing countries.

Difficult access to credit is another factor often impeding initiatives and the implementation of conversion projects. Some farmers do have access to financial resources and are more likely to consider conversion. However, they also have to contend with marketing constraints. The market for organic products is still comparatively small and is mainly concentrated in the European Union, the United States and Japan.

The above sets out some of the more direct constraints to conversion experienced by small holders. However, the issue is wider and more complex. Individual small holders are usually advised to join or to form cooperatives or other farmers' groups in order to overcome some of the problems described above, to create the required critical mass, build the necessary infrastructure (primary processing and packaging facilities), cut costs and improve market access.

Certification of production undertaken in tropical regions is yet to be developed. Existing standards have been developed mainly in the Northern countries and are focussing on the farming of species grown in the Northern hemisphere. Production conditions in the tropics may differ from those in the North and appropriate standards have to be developed. Regarding aquaculture, tropical production often uses polyculture systems which are not yet covered by existing regulations.

Given the lack of sufficient market information on the exact consumer needs and legal requirements, exporters from developing countries may find it easier, initially, to provide the processing industry in the industrialized countries with raw material, as they would have difficulties to compete with regional brands. The preferred counterparts for developing country exporters might be specialist importers of organic products.

In conclusion, globalisation of the organic food industry will continue. The speed of globalisation however, will be at a slower rate than for other sectors of the food industry, especially as differences continue in terms of organic standards and also as some consumers still prefer 'to think local rather than act global' when buying organic products.

As it is easier to enter a new market during periods of strong growth, the current market situation should be exploited to the maximum by potential exporters, in order to secure a strong foothold before competition further intensifies. This is likely to happen over the next few years.

Some recommendations developed by IFOAM[34] regarding organic agriculture can be useful in this context. They are summarized as follows:

- identification of existing organic systems and possible certification
- official national/international support to organic production systems
- development of local markets and export opportunities for organic products
- promotion of locally value-added, certified production for export to high-end markets
- providing information networks/technical assistance on best practices (research, extension services, training, etc.)

5. SUSTAINABLE CAPTURE FISHERIES AND ECOLABELLING

The distinction between wild and organic seafood remains vague. The US Congress recently instructed the Secretary for Agriculture to develop guidelines allowing wild seafood, including Alaskan salmon, to be labelled 'organic'. In contrast, the European Union does not permit the sale of wild fish as organic (EC No. 2092/91) and with the decline of fish stocks destined for human consumption, public awareness of inappropriate fishing techniques is growing.

Up to now, organic aquaculture and wild capture fishery have been kept separate by the certification bodies. Although organic products and products from sustainably managed capture fisheries may share many characteristics, including the concern for the environment, there is one fundamental difference between organic and wild products.

Organic production foresees full control over the entire production process with control of all input factors such as juveniles, feed, water quality, etc. Capture fisheries on the other hand, with the fish swimming in the wild in open waters, cannot guarantee the same control of the production process or

[34] IFOAM Dossier Organic Agriculture & Food Security

the environment. This does not mean that wild production is necessarily inferior to organic production; it is the underlying criteria that are different. Organic seafood products can for this reason only come from aquaculture and not from capture or wild fisheries.

Fish farming in ponds or cages can in principle be controlled at every single moment of the production chain. The different national and international certification bodies dealing with organic aquaculture – now between 20 and 25 - develop standards with the purpose of regulating the various phases of production. They fix limits for certain values and indicate permitted and prohibited substances for the farming process. For instance, the larvae/eggs have to come from a certified hatchery, the water quality in the ponds is constantly monitored, stock densities are limited and the feed used for organic aquaculture has to be traceable. Production areas and processing plants are regularly checked in order to ensure constant quality for the final consumer.

Wild fish on the other hand is difficult to monitor during its entire lifecycle. Just to mention one problem, how could its nutrition be controlled sufficiently? It is for reasons like this that most organic certifiers will not take wild harvested fish into consideration. As the consumers' demand for certification is growing however, the producers of wild fish products are increasingly under pressure to label them.

In the case of wild or capture fisheries, the label is considered as 'ecolabel'. So far, the only label available for wild fish is that provided by the Marine Stewardship Council (MSC) The Marine Stewardship Council was founded by Unilever and the World Wildlife Federation (WWF) in the mid 1990s in order to create an organization for the promotion of sustainable fisheries. MSC has developed an environmental standard for sustainable fishing, accredits third party certification bodies and licences the use of the MSC label. The main objective of MSC is the protection of endangered fish stocks and the preservation of the ecosystem. They monitor aspects such as the respect of quotas, the use of appropriate technology and bycatch quantities. But social, economic and commercial aspects are also decisive for accreditation.

The MSC Board of Trustees is now discussing the inclusion of organic aquaculture standards in its current 2004 programme. So far, seven species have been certified and more than 40 are being monitored for future labelling. In 1996 Unilever committed itself to convert entirely to fish supplies from sustainable fisheries by 2005.

The German seafood manufacturer FROSTA initiated a move to market exclusively MSC-labelled products at the beginning of 2003, but at the end of the year decided to reduce the share after declining sales. According to FROSTA, the main reasons for this initial failure in the market were higher-than-expected costs and the lack of consumer awareness on the significance of the label.

Australian Sontari Seafoods has increased its sales of hoki by 30 percent after the introduction of a new packaging bearing the MSC logo. This company imports about 30 percent of all pre-packaged hoki sold in Australian supermarkets and recently started deliveries to one organic retailer.

During the European Seafood Exhibition 2004, the Carrefour retail chain launched a new seafood label based on responsible fishing. In an initial phase, the label will apply to frozen cod products of Icelandic and Norwegian origin. It is planned to extend the product coverage over time.

Apart from MSC, there are labels for tuna caught without harming dolphins, called 'dolphin-friendly', 'dolphin-safe' or the 'Flipper Seal of Approval'. The dolphin-safe tuna is a topic of particular importance in the United States, but cans with a dolphin-friendly label are also found in Europe. A 'turtle-safe' label exists for shrimps and prawns.

FAO's Code of Conduct for Responsible Fisheries (CCRF) is the most significant globally recognized international framework covering the world's marine, coastal and inland fisheries, including aquaculture, and provides valuable guidance when attempting to define sustainable wild seafood production as well as sustainable aquaculture production. The CCRF, which was prepared by FAO in

collaboration with numerous stakeholders, was adopted by more than 170 Member States in 1995. The nature and scope of the Code is indicated as follows: 'The Code provides principles and standards applicable to the conservation, management and development of all fisheries. It also covers the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management.' The CCRF is voluntary, but national governments are encouraged to implement the CCRF regulations through their integration in national legislation. MSC based the development of its regulations on the CCRF.

Recently, many of the organic aquaculture certification bodies have also started to discuss the certification of capture fish as 'sustainably harvested'. In the absence of a common regulation on sustainable seafood production and organic aquaculture production, some 'hybrid' organic products are offered on the market. Examples are prepared products containing wild but unlabeled fish in combination with other certified organic ingredients like vegetables or herbs (e.g. BuyBio Brand in Germany).

Greenfields Ltd from Entebbe, on Lake Victoria in Uganda is a processor of wild caught Nile perch and wild tilapia. The chilled or frozen products, produced according to EU standards since 1997, are exported to the United States, Europe and Japan. In 2003 Greenfields also obtained the ISO 9001:2000 certification. Their production capacity for skinless fillets, skin-on fillets, H&G, whole gutted portions/steaks of different grades and kosher tilapia and Nile perch totals 40 mt per day. Fish is caught only by traditional small scale fishers.

Agro Eco consultant Magnus van der Meer reports that in 2003 Greenfields committed itself to SIDA's EPOPA programme (Export Promotion of Organic Products from Africa) to produce the first certified sustainable fish in Africa by 2005. One problem of certification of Nile Perch in Lake Victoria might be the fact, that it is not a native species but was introduced artificially in the past and has had a negative impact on the lake's biodiversity.

The US Congress has now formally passed an amendment to the Organic Foods Production Act, in law, that allows labelling wild caught fish as organic. However, this decision was heavily criticised by the Organic Trade Association.

The 'Traceability of Fish Products' is a concerted action project, funded by the European Commission, aiming at more transparency. The aim of the TRACEFISH project is to bring together companies and research institutes to establish common views with respect to what data is needed to follow a fish product through the chain from catch/farming to the consumer.

Although not related to fish consumption, it is interesting to observe that even in the ornamental fish sector 'labelling' is becoming more and more an issue. The Marine Aquarium Council (MAC) is promoting certified marine ornamentals on both the supply and the demand side. MAC is currently developing standards and procedures for sustainable marine aquarium trade. Other stakeholder associations like the Marine Aquarium Societies of North America (MASNA) support this evolution towards responsible trade.

6. MARKETS AND TRADE CHANNELS FOR ORGANIC AQUACULTURE PRODUCTS

As stated earlier, organic aquaculture is still at a very early stage and production volumes are low. Therefore it is difficult to draw general conclusions on the distribution system for its products. For that reason, the following paragraphs concentrate on the current status of national markets and distribution systems for fishery products and include more specific references to organic aquaculture products where available.

6.1. UNITED STATES OF AMERICA

POPULATION (1,000)	**!80,434**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**!1.4**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (IN MT LIVE WEIGHT)	**ǂ,004,468**
IMPORTS OF FISHERY PRODUCTS (IN MT LIVE WEIGHT)	**ǂ,123,696**

According to a USDA study, domestic seafood consumption will rise from its current level of 6.8 kg to 7.26 kg in product weight by 2020. Considering the expected population increase of 18 percent from about 285 million now to 336 million by 2020, an additional 1.81 million mt live weight of seafood would be required. This growth rate outstrips all other protein providing markets in the United States. A shift in the American society's age structure towards older people also brings a change in the consumption pattern. Researchers have found that consumers over 65 eat 53 percent more seafood than the average population. Health concerns are the main drivers for these consumers to choose seafood instead of meat.

The favourite species are shrimp, salmon, tilapia and catfish, which, except for catfish, are mainly imported aquaculture products. In 2003, the value of shrimp imports to the US market totalled more than US$ 3 billion. While the United States is a major seafood exporter, its exports of aquaculture products are relatively small: some farm-raised trout and salmon, mainly to Canada and Mexico, and oysters and clams to Canada. The catfish industry has been attempting to develop export markets in Europe but has met with only limited success. On the other hand, as indicated above, the United States is a major importer of farm-raised seafood products.

For the retail sector, seafood could overcome its current status as least-profitable perishable department (1.96 percent contribution to sales, 3.3 percent contribution to profits and 24.5 percent average gross margin) if the product presentation became more responsive to the older consumers needs. Smaller, well labelled value-added portions, available in self-service departments, could be a solution. Organic seafood has the potential to enter this important niche as it responds exactly to the new needs for high-quality, healthy, tasty and convenient seafood products.

About 79 percent of global aquaculture will be taking place in developing countries by 2020 and important trade opportunities are emerging for these countries in the US market. According to the Texan Permian Sea Shrimp Co., with regard to organic aquaculture, 'The market is getting better. There is some interest but so few products available and the rules are all under development and revision that the market, as far as big retailers are concerned, is still trying to sort it all out. The 'eco-labels' from all the various green groups are confusing the issue as well. I would like to see the certified organic overtake the eco-labels as the certification of choice and the public has to understand that wild caught fish or shrimp can never be 100 percent under someone's control thus can never be organic. It is a tough road at this point for those of us trying to change the face of seafood but there is a huge opportunity out there'.

The main problem for organic aquaculture products in the US market is, effectively, the uncertain regulation. For the moment there is no national organic aquaculture regulation and the USDA national organic label cannot be used for aquaculture products. However, in October 2000, the National Organic Standards Board (NOSB) established an Aquatic Animal Task Force and two related working groups to advise the NOSB on the possibility of organic certification standards for operations that produce aquatic animals. A set of standard recommendations was proposed by the Aquaculture Working Group in 2001 and was approved by NOSB in 2002. Apparently, shrimp, carp and possibly also tilapia might be labelled with the official USDA organic label. Carnivorous species such as salmon, trout and char feeding on fishmeal seem to be excluded. However, this standard has not yet

been officially adopted by USDA/NOP. The National Organic Aquaculture Work Group (NOAWG) had its inaugural meeting in Hawaii in March 2004.

It is likely that a number of companies and possibly the aquaculture industry in general, will jump on the organic bandwagon, particularly tilapia and catfish producers. The key issue will be the use of antibiotics and, in the case of tilapia, methyltestosterene, which is used to 'sex reverse' the fish so that only females are grown to market size.

The US market for organically grown fish and shellfish will initially be in supermarkets and restaurants that already offer organic products. The US supermarket chain Whole Foods has indicated that it would purchase organic fish and a number of food coops around the country would most probably do so as well. Whole Foods has chosen not to offer its seafood as 'organic', even if it has received certification in another country outside the United States, until there are US national standards. However, staff have been instructed to give detailed indications on the origin and the production methods of the fish currently being sold.

Wild Oats, with its nationwide chain of 110 natural and organic food stores in the United States and Canada, has recently decided to stop selling non-organic farmed salmon and replace it with certified organic products. In particular, Wild Oats will be supplied with organic salmon by the Irish producer Clare Island Sea Farm. Dublin based Emerald Isle Global Trading Limited (EIGT) has signed a contract with Wild Oats Markets in August 2003 to source and supply Irish seafood products for the company as the exclusive national retailer of organic Irish salmon in the United States. Wild Oats' seafood programme is one of the fastest growing sectors of the company, and enjoyed 32 percent sales growth in 2002.

6.2. EUROPE

Distribution channels in Europe differ at the national levels. However, the interest of supermarkets – specialized or conventional ones – in fish and fishery products is a common phenomenon in all countries. In fact, in most European countries supermarkets sell more than 50 percent of the total fish supply. For some products the share is even higher. For example, in France and Spain over 80 percent of salmon is sold through supermarkets. The retail market comprises supermarkets, fishmongers, street markets, other food stores and speciality shops. The market share of supermarkets is constantly increasing at the expense of the smaller traditional shops. Traditional small sized health food shops often lack storage facilities for fresh and frozen fish products. The involvement of supermarkets in the distribution of organic products translated in major growth and corresponding increase in market share when compared with distribution by smaller specialized shops. The presence of organic products in supermarkets has also had an impact on consumer price premiums, which are lower than in countries where the market is dominated by specialized retailers.

As noted earlier, there are some specific consumer patterns and trends in the European market:

- Health
  The consumer has a shown a significantly increased interest in a healthy life and, consequently, in the consumption of healthy food. Fishery products are generally associated with healthy foods and regarded as a substitute for meat.
- Quality
  The consumer appreciates quality more and more and is willing to pay a high price for a good quality product.
- Convenience
  Consumers increasingly take into account the time needed to prepare and cook meals. Fishery products fit in this trend, since most of the products are quite easy and quick to cook. However, fully prepared fishery products, whether frozen or fresh, are preferred.
- Income
  The relatively high standard of living in the EU gives consumers the opportunity to buy a wide variety of fishery products. Convenience food is appreciated by the consumer as it fits in

the modern lifestyle which requires time saving, tasty meals – especially as more women are actively taking part in the labour market.

With an increasing demand for value-added products, the importance of the processing industry is evident. The higher end of the restaurant and catering sector is looking for special and exotic fish such as tilapia and shellfish species. This sector usually purchases from domestic wholesalers or importers.

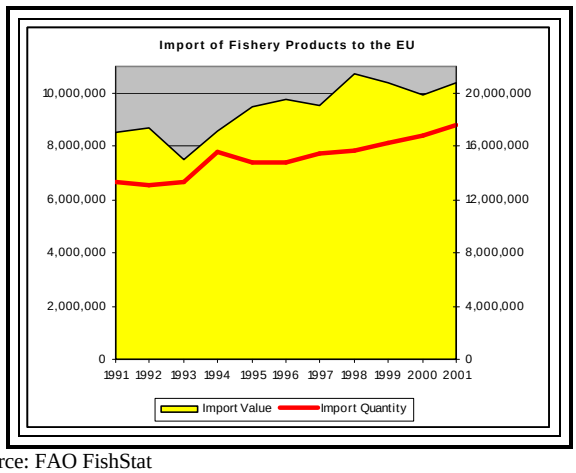
A wide range of actors are involved in the European fish trade: buying/selling agents (commissions ranging from one to five percent), importers, the processing industry (purchase products from importers or through an agent or directly from producers), and the retail/distribution organizations (purchase from wholesaler or importers, however some bigger supermarkets purchase directly from the producer).

Some major distributors are still somewhat hesitant towards organic aquaculture products. According to a representative of Unilever, this is partly due to the prevalence of wild caught species – but also to the difficulties in justifying higher prices for organic products and the currently insufficient production capacities.

Retail prices for seafood products are often highly variable due to fluctuating supply, often due to seasonality, and consumer preferences. However in most countries fish consumption also follows seasonal patterns. With regard to the margins, a CBI market survey[35] estimates that importers need a 5 to 15 percent mark-up to cover costs and risks. The competition in the European market levels the trade margins and so the upper limit on gross profits for importers is estimated to be at about 25 percent for conventional products. At the retail level, the profit margins for canned fish are around 10 percent in supermarkets but reach up to 50 percent for fresh fish at specialized retail shops. The gross profit of a specialized fish retailer or market vendor in Europe is from 30 to 40 percent. Compared to the CIF price, the consumer prices, including the value-added tax, are from 50 to 100 percent higher, depending on the type of retail outlet.

European imports of fishery products are increasing, in both value and volume. The European consumer prefers fresh/chilled/frozen fish (67 percent of the total consumption volume), followed by shellfish (18 percent), dried/salted/smoked fish (10 percent) and other fish products (5 percent).

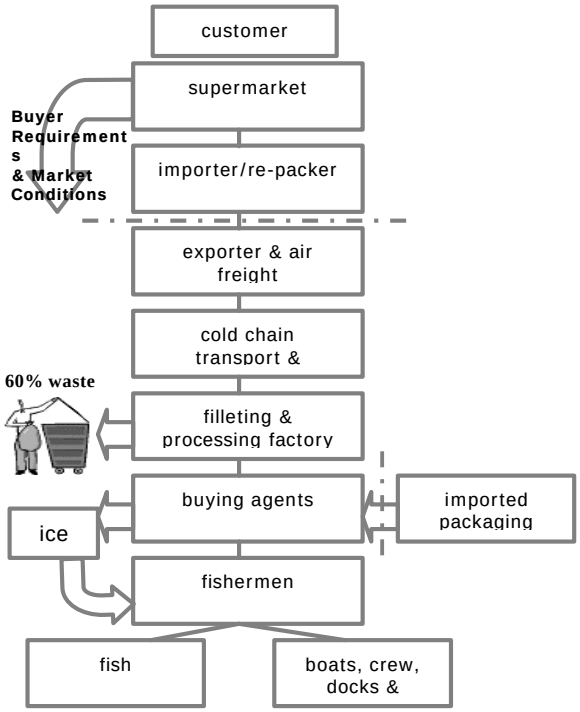
Chart 20. Imports of Fishery Products to the EU – Volume and Value (mt and US$x000)



Source: FAO FishStat

[35] CBI, 2003, *EU Market Survey*: *Fishery Products*

The following flow chart indicates a possible distribution of value along the fish production and distribution chain.



Source: Ian Sayers, International Trade Centre (UNCTAD/WTO), Geneva

Approximate Cost € / kg		Approximate Onward Selling Price € / kg
€18.80 /kg Inspected, labelled & Duty Paid		€ 23.50 Fresh fillets on ice incl. taxes
Total so far	= €16.20/kg	€ 18.80
Fin. & Duty	= € 1.20/kg	
Re-Packing	= € 0.50/kg	
Total so far	= €12.30/kg	€14.50
Financing	= € 0.50	
Transport	= € 1.50	
Total so far	= € 9.00/kg	€10.30
Processing	= € 0.50	
Transport	= € 2.30	
Total so far	= € 4.65/kg of filleted fish	€6.20 per kg of filleted fish
Filleted cost		
60% wasted	= € 4.25/kg	
Processing		
Re-packing	= € 0.20	
	= € 0.20	
Packing	= € 0.15/kg	
Ice	= € 0.10/kg	€1.70 per kg of whole fish
Fish	= € 1.30/kg	
€ 1.00 per kg Amortized costs of crew, boat etc.		€1.30 per kg of whole fish

Austria

POPULATION (1,000)	**8,085**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**11.4**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**92,501**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**93,755**

Per caput fish supply in Austria was 11.4 kg in 1999.

Presently about 66 tonnes of fish are produced annually from organic aquaculture in Austria. An association of 25 carp and trout farmers, founded in 1994, is responsible for the production techniques, marketing and national distribution ('Arge Bio-Fisch'). Domestic distribution of about 20 mt annually is as follows: 20 percent to health food shops, 30 percent to catering trade/restaurants and 50 percent to weekly local markets and through direct marketing. Compared to other EU-countries, there are still very few organic supermarkets in Austria. The fish is sold almost exclusively as fillets. Compared to conventional products, the price is about 30 percent higher.

France

POPULATION (1,000)	**59,026**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**30.2**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**1,780,678**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**1,543,981**

The French seafood market is one of the most important in Europe, with domestic production far below consumption levels (per caput consumption was 30.2 kg in 1999). France is the main importer and consumer of salmon in Europe. Other important species are shrimp, tuna, cod, sole and molluscs. Consumption of fishery products reached 767,779 mt in 2001.

There are about 800 companies distributing fresh fish in France. Some own plants in Africa and their have their own fishing fleets. Imports of high value fresh products arrive by air through the Paris airports and also through Marseille on the Mediterranean coast. Imports from other EU and European countries are usually brought in by road. Built more than 20 years ago and located about 13 miles south of Paris, Rungis is the largest wholesale market in France for all fresh and frozen food items including fishery products. Rungis is home to wholesalers, producers/sellers and service companies, including importers, buying agents and distributors.

Despite consolidation, many traditional French wholesale companies continue to lose ground to large super and hypermarket chains, and most recently to the 'discounters' who are expanding their own wholesale activities.

Over the past 10 years, supermarkets have gained a very strong position in the French retail market at the expense of fishmongers and open-air markets. In 2000, supermarkets accounted for a market share (in volume) in the distribution of fishery products of around 67 percent. One of the major French retail chains, Carrefour, offers some organic seafood products like Irish salmon and trout e.g. 'Les rillettes de saumon' Carrefour Bio 125 g at € 4,90 (39,20 €/kg)).

Germany

POPULATION (1,000)	**82,026**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**12.4**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**1,020,407**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**1,135,380**

The heart of the German fish industry is concentrated around Bremerhaven, Cuxhaven, Hamburg and in Mecklenburg. The Bremerhaven auction is the most important in Germany. However the market is changing at the expense of the auctions. Nordsee and other big seafood suppliers increasingly purchase their products from leading international operators, thereby bypassing the auctions they have used for so many decades.

The trade structure in Germany is also changing. Frankfurt has become an important hub for airborne seafood imports. International supplier groups have opened subsidiaries and are building up new logistical chains to serve the market directly, at the expense of the intermediaries who act between the fish landing places and the sales at the supermarket. Thus, the wholesale trade is losing ground. Many cannot adapt to the concepts of fully serviced delivery and sophisticated rapid servicing for the supermarkets. The emphasis is on fewer, but bigger suppliers. A less fragmented market may be accompanied by private labels for other than processed fish. On a volume basis, 79 percent of fishery products are purchased at multiple retail stores, which translate to 69 percent on a value basis.

Supermarkets/hypermarkets such as REWE, Metro, Edeka, Aldi, Spar and Tengelmann are the most important outlets for sales of smoked and canned fish and the second most important for fresh/chilled fish. Fish speciality stores account for 7 percent of sales volume and other outlets such as farmers/street markets for 14 percent. Fish vans and department stores account for the remaining sales. When comparing 2001 with 2000, discounters gained the most from increased sales, while fish speciality shops lost sales volume. Average prices increased by 2.7 percent, which resulted in a higher sales value for all retail types. Per caput consumption of fish in 1999 was 12.4 kg.

In general, organic seafood products are still underrepresented. Total fish consumption has increased in recent years – encouraged also by phenomena such as the mad-cow crisis. In 2001, it amounted to 1.15 million mt. In 2002 total retails sales of seafood amounted to more than € 3 billion. Alaska Pollack, herring, tuna and salmon being the most popular species. Organic species already available on the German market are tench, pike, char, trout, carp, salmon and shrimp.

Most organic fish is sold frozen. The main season seems to be during the colder months, with a peak of 20 percent of annual sales taking place before Christmas and during Easter time. According to a representative of a specialized organic wholesaler, the potential for organic fish is far from being exhausted as, for the time being, the offer is still too low compared to demand and the prices are far too high for a broader public. The most popular locally cultivated species for German consumers is trout, namely rainbow trout originating from North America. But also the domestic brown trout and char from organic production are more and more requested. Also carp is a traditional delicacy during wintertime. The main trade channels for organic fish in Germany are specialized health food stores, markets, farm gate sales and direct marketing.

The German wholesaler Isana offers organic products under the label 'bio-verde'. The range includes several vacuum packed fish products, namely Irish salmon from Clare Island and Italian trout from Friulian San Daniele. The salmon is offered smoked or, marinated, as is the trout. The latest product introduced is smoked German char from Westphalia. Retail prices vary from € 5.49 for 100 grams of smoked or marinated trout fillets up to € 7.49 for 100 grams of lightly smoked salmon with truffles. According to the quality manager the products are requested throughout the year – reaching peaks in periods like Christmas.

Demeter-Felderzeugnisse GmbH**,** the distribution company for an association of farmers and market gardeners working in a biodynamic way, is one of the major German wholesalers for organic products and supplies specialized health food retailers with frozen seafood products. According to the person responsible for frozen products, the product range only features fish from wild catch, namely Irish salmon steaks (37.99 €/kg), frozen Atlantic haddock fillets (€ 15.49 for 750 grams) and Icelandic cod fingers (180 grams at € 3.99) or breaded fillets (450 grams at € 9.99) provided by the brand 'Wild Only - Only Wild' of Alice Virmond. The latest product is pollack with organic Pesto Gratin in a 400 grams pack.

Ökofrost, a specialized wholesaler for frozen organic products, supplies about 300 shops with various seafood products. For the time being the only organic aquaculture product is shrimp from Ecuador, while there are also some certified wild fish products. This supplier has experienced that once the shops started ordering fish they continued to do so. They emphasise the

importance of the proper introduction of the new products, both to the shop staff and to the consumers. This supplier predicts an increase of 15 to 20 percent in organic fish trade in 2003.

Ristic AG from Oberferrieden, Germany, processes 'Greenaqua Bio Shrimp', which have been available in specialized health food stores such as Alnatura and Tegut since 2002 at a cost of € 4.99 for 200g. The product has received the best possible mark 'Sehr gut' in Öko-Test 07/2003.

Ökofrost, a specialized wholesaler for frozen organic products, confirms the increasing demand for Ristic's 'Bio Shrimps', predicting a major increase for organic seafood products in the future. The price premium compared to conventional products is justified by the higher production costs and doesn't seem to constitute an obstacle for consumers. The Ecuadorian certified shrimps are processed in the German certified 'Prime Catch Seafood' processing plant and presented as peeled, cooked, deveined, IQF products. Even though organic shrimp account for only about 1 percent of Ristic's total shrimp sales, the company aims for a sales increase of about 5 percent in 2004. New farms in Brazil have been contacted for organic production and a new fleet in Costa Rica should also introduce the ecological principles into the conventional wild capture products. In 2003, about 50 mt have been sold (compared to 20,000 mt annual German shrimp consumption). The 'Bio shrimp' is sold to ten nature food retailers as well as to the conventional chain Tegut and to Swiss COOP.

The German market leader for seafood products, Deutsche See, entered the organic market in 2002 with fresh Scottish salmon, certified by the UK Soil Association, and confirmed its interest in developing an organic product range. As from February 2004 more salmon products and Naturland-certified shrimps from Ecuador will be introduced (frozen shrimps and frozen salmon fillets, both presented in a two portion vacuum pack). Additionally, the Ecuadorian shrimps will be available fresh and in delicatessen salads later this year. So far the share of organic products in the total turnover only represents one percent, but it is expected that this will increase. The introduction of organic trout is planned for autumn 2004.

As was stated earlier, in Germany organic products are distributed through specialized health food stores, major grocery store chains like Kaufhof and Edeka (Irish salmon marketed under the own brand Bio Wertkost) and the catering sector. An important indicator for an increasing consumer interest is the fact that company canteens (for instance VolksWagen and Audi) are also becoming customers of Deutsche See organic seafood products. In 2003, it was estimated that about 50 mt of organic fish were sold, with a price premium varying between 25 and 45 percent.

Greece

POPULATION (1,000)	**10,591**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**24.9**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**263,439**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**139,220**

The Greek enterprise 'Thinkgreen' offers canned wild fish (sardine, anchovy, tuna) combined with organic ingredients such as olive oil and vegetables. These products are sold in most European organic supermarkets and health food shops.

Greek per caput consumption of fish products was 24.9 kg in 1999.

Hungary

POPULATION (1,000)	**10,020**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**3.8**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**38,308**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**22,462**

As mentioned earlier, some organic carp is produced in Hungary. According to the Hungarian Research Institute for Fisheries, Aquaculture and Irrigation, the national market for this product is currently extremely limited and producers are oriented towards Western European markets. In order to receive the necessary price premium, organic carp has to be presented to the final consumer as a labelled and preferably a processed product.

Ireland

POPULATION (1,000)	**3,763**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**15.6**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**58,595**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**38,389**

The Irish fish farming industry is the fourth largest in the world and concentrates mainly on salmon, and trout. About 2 500 mt of the country's organic production is exported to Germany. Mussels are also an important product and as was mentioned earlier organic production has been ongoing since 1999.

The salmon farm on Clare Island described in detail earlier in this document, produced about 1 400 mt in 2002. Exports under the label 'St Patrick' were mainly to Germany (~40 percent under the label 'St Patrick'), Switzerland and France (~35 percent). The price of eviscerated organic salmon on the French market is 80-100 percent higher than the price for conventional salmon. In France, 70 percent of the imported salmon from Clare Island is smoked by Safa and Labeyrie. In Germany, 100 g smoked salmon from Clare Island costs between € 5.00 and € 6.50 compared to € 1.50 to € 4.00 for conventional smoked salmon. The product is traded under various brands in Germany: Adam Bio Lachs, Ocean King Bio-Lachs, St. Patrick Bio-Lachs, Aran Atlantik Bio-Lachs, Erftland Bio-Lachs.

Netherlands based Nutreco Holding N.V. is an international food company intervening at various stages of the fish, poultry and pork production chains. Organic production is an integral strategy in the development of Irish salmon. The annual production of organic salmon in Ireland, as reported by Nutreco, is about 3 000 mt of fresh (whole, gutted, filleted/portioned) and frozen (whole/filleted) product. Nutreco is also involved in the production of organic salmon feed. (Clare Island/Laschinger/Mannin Bay Seafarm)

As was stated earlier, Ireland is an emerging market for organic food, and with a per caput fish consumption of 15.6 kg in 1999, it is not among the largest consumers of seafood, however even

markets traditionally not connected with demand for organic products are showing potential as urban consumers are rediscovering their own roots through organic food. The promotion of Ireland's organic seafood in the restaurant sector couls also be a bonus for the tourist industry.

Italy

POPULATION (1,000)	**57,531**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**23.4**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**1,346,211**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**994,407**

Italy is the world's fifth largest importer of seafood products, especially of shrimps, prawns and lobsters. Per caput consumption of fish was 23.4 kg in 1999.

Fishery and aquaculture products are distributed mainly by wholesalers. They buy from domestic fishermen and aquaculture farmers and transport the fish directly to smaller wholesalers located in the larger cities, to fishmongers, restaurants and caterers. Also supermarkets usually rely on wholesalers to organize product "platforms" from which the fish is distributed to the various outlets belonging to the supermarket chain in question. The largest wholesale fish market in Italy in terms of volume is in Rome, whereas the Milan wholesale market has the highest turnover in value.

Imported fresh fish is brought in principally by road from European countries but Italy's two international airports in the Lombardy region, where many of the larger seafood processors are located, and also Rome airports, play an important role in imports of fresh seafood particularly from developing countries.

Despite the growing share of hypermarkets and supermarkets in fish distribution in Italy, the role of the local fish shop is still important, due to the high level of personalised services they provide. The fish shops, with the exception of some mega-stores, are too small to import directly and choose to buy from the local wholesalers, operating either in fish markets or outside. The future role of local fish shops could be penalised however, by the increasing number of fresh/wet fish stands in super/hypermarkets. The variety and quality of fish products is generally extensive and attractively displayed. The services provided on wet fish stands at modern distribution facilities (cleaning, cutting, and filleting) are improving.

Major distributors receive frozen fish in consumer-ready packs from importers and wholesalers. Supermarkets normally offer a wide variety of frozen seafood, including value-added products. In addition, frozen shellfish reaches the final consumer primarily through supermarkets and small retail outlets that sell exclusively frozen foods. This evolution has had a significant impact on the structure of the Italian seafood distribution network. Super- and hypermarkets now represent 58 percent of Italian fresh seafood sales and are now increasingly buying directly from abroad and from aquaculture farmers or local wholesalers.

Seafood distribution in northern Italy differs very much from the south. In the north, seafood distribution through hyper- and supermarkets already accounts for 50 percent of sales, while in the south this stands at somewhere over 20 percent. Although there are these substantial regional differences, the large national and international chains like PAM, Esselunga, Coop, Carrefour and METRO are present in all regions.

Lithuania

POPULATION (1,000)	**3,701**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**19**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**70,431**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**78,365**

In 2001 the consultant companies Agro Eco and Scanagri from Denmark organized a two-day workshop at the Agricultural University Kaunas. Officials of the Ministry of Agriculture attended this meeting. A brief global overview of the basic principles of fish farming practices was given and standards for organic fish farming were presented and discussed. A fish farm was visited and the possibilities of conversion to organic farming practices were discussed. In view of the observed potential for organic carp farming, Agro Eco is seriously considering establishing standards for organic carp farming in Lithuania.

The Netherlands

POPULATION (1,000)	**15,793**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**20.5**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**323,597**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**800,844**

In 2000, more than 204,000 mt of fish was sold at Netherlands' fish auctions for a value of € 541 million. The main auctions are situated in Yerseke (mussels), Urk (flatfish), Ijmuiden and Harlingen. These auctions receive the fish directly from vessels unloading in the ports. The buyers are wholesalers, exporters and the fish-processing industry. Some of the Netherlands' auctions are also frequented by retailers. Some foreign vessels also land and sell their catch at these auctions.

The distribution of all fishery products sold in the Netherlands is shifting rapidly from fishmongers and street markets to supermarkets. This is mainly caused by the increased sales of frozen, breaded, and canned fish, which are commonly sold in grocery stores and supermarkets.

This shift is illustrated by an increase in supermarkets' share of fishery products sales from 39 percent in 1999 to 50.4 percent in 2002. Fishmongers show an increasing specialisation in smoked and fried fish and various forms of catering services. Although fishmongers have faced up to the competition by forming buying groups at fish auctions, their importance in the distribution chain is decreasing.

Herring, salmon, plaice, sole, mackerel and mussel are the most popular species for the Dutch consumer, but also shrimps and prawns are increasingly accepted. The volume of seafood sales amounted up to 41 million mt in 2002. In 1999 per caput consumption of seafood stood at 20.5 kg.

Dutch aquaculture production is very intensive and not adapted for conversion to organic in the short term. There could, sooner or later be some MSC certification for products from the Wadden Sea.

Norway

POPULATION (1,000)	**4,449**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**50.8**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (LIVE WEIGHT IN MT)	**225,909**
IMPORT OF FISHERY PRODUCTS (LIVE WEIGHT IN MT)	**390,187**

The Norwegian per caput consumption of seafood was 50.8 kg in 1999. In some stores, organic arctic char from Fjordroye AS is on sale and the Gala Mountain Hotel, N-2644 Gala in Gudbrandsalen, Gala, in the South of the country serves organic-approved Gala trout.

One of Coast Seafood producers Flakstadvåg Laks have delivered their first consignment of organic Atlantic salmon to Coop in Sweden. Coast Seafood believes this is one of the new trends in the fish market where exporters/producers need to have a very close relationship with customers in order to produce a product based on their specific requirements. This is a natural segmentation of the global market which will expand further. A survey in June 2000 reported that the production of organic salmon costs between five and 15 Kroner per kilo more than for conventional salmon.

Fish and fish products are Norway's second most important export commodity after mineral oil. The market could provide an opportunity for organic fish and processed organic fish products. Exports could include salmon, arctic char, trout, shrimps and mussels. There could also be a market for organic fish meal, as demand is increasing in mainland Europe but appropriate marketing will be important.

Spain

POPULATION (1,000)	**39,892**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**44.4**
TOTAL SUPPLY OF FOOD FISH PRODUCTS(LIVE WEIGHT IN MT)	**1,772,878**
IMPORT OF FISHERY PRODUCTS (LIVE WEIGHT IN MT)	**1,513,300**

Spain is one of Europe's leading consumers of seafood products with a per capita consumption of 44.4 kg in 1999. In 2001 a total of 1.79 million mt was consumed. Hake is the most important species, together with sardines, anchovies, flatfish, shrimp, tuna, squid, octopus and other molluscs. Spain is also the third largest import market for fish and fishery products in the world, after Japan and the USA.

Although organic products have not made any serious impact in the market so far, given the high national fish consumption pattern the potential for further growth is substantial. It must also be emphasised that over the last few years Spanish consumers in general, have become much more aware of food safety and environmental issues, factors that should stimulate demand for organic products in the future

Regarding distribution, when fish is offloaded in Spanish ports it is sold by auction to authorised wholesalers. It is then distributed to central markets and to various MERCAs. Vigo is the main hub of activity for the fishing industry.

MERCA is a state-owned company that is part of the Spanish Ministry of Agriculture. Seafood, as well as other fresh food products are marketed and distributed in Spain through the MERCA distribution network. In cities with no MERCA, food products are distributed through the central city market. Retailers, ranging from the small fish shops to the large supermarkets and hypermarkets and also some restaurants, buy fish at the MERCAs and the central markets.

Even though the Commercial Director of Pisicicoltura Sierra Nevada SL complains about the inadequate visibility of organic seafood products in his domestic market, he hopes that a future harmonization of the national and international standards will improve the marketability. The company's products, trout, sturgeon and caviar, are sold through wholesalers and by direct marketing. A substantial part of the production is also sold to the local catering sector. A 60 grams glass of organic Caviar de Riofrío C.I.T.E.S. Beluga is available at € 97, while portions of smoked sturgeon cost € 40 per kilo.

(Retail Prices: Caviar: glass, 60 g, € 97 (compared to the conventional caviar offered at € 93). Sturgeon: whole loin, smoked, vacuum packed 39.16 €/kg; sliced smoked loin, 200-350 g vacuum packed, 40 €/kg; whole, fresh, eviscerated, 8-15 kg, 24.59 €/kg. Trout: eviscerated, smoked, vacuum packed 11.84 €/kg. Prepared: pastes made of organic fish, ecological vegetables and olive oil – Mediterranean Sturgeon paste 240g € 3; Sturgeon paste à la Campesina 240g € 3; Trout paste 240 g € 2.09. Pastes made of organic fish backs and livers, ecological vegetables and olive oil – Sturgeon pâté 115 g € 4.56, Trout pâté 1150g € 2.33.)

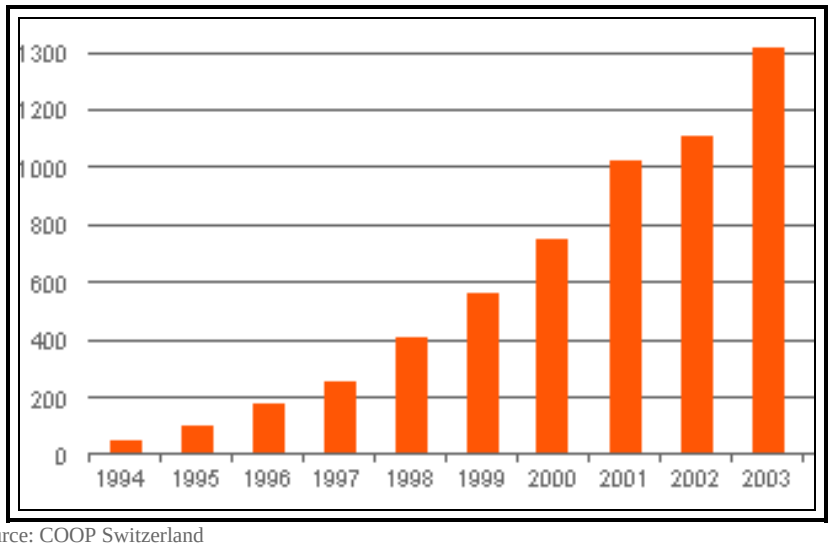
Switzerland

POPULATION (1,000)	**7,170**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**14.8**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (LIVE WEIGHT IN MT)	**106,404**
IMPORT OF FISHERY PRODUCTS (LIVE WEIGHT IN MT)	**104,243**

COOP Supermarkets, the second largest conventional retail chain in Switzerland, has been selling organic fish (shrimp, salmon fillets, marinated salmon, smoked salmon, trout fillets, smoked trout fillets, whole trout, carp species including grass carp) in about 200 of its stores since 2002. Organic fish offered under the brand 'Naturaplan' already accounted for 5 percent of the whole COOP fish trade turnover in 2002 and a 40 percent increase for 2003 was predicted.

The proportion of COOP's organic sales by species is 15 percent for salmon, 20 percent for trout, 100 percent for carp and almost 80 percent for shrimp. The organic seafood is purchased exclusively from the producers themselves. The price premium depends on the added value of the specific product, and varies in average between 10 and 20 percent compared to conventional products, both for the retailer and for the final consumer.

Chart 21: Turnover of the four COOP brands Naturplan (organic food), Naturaline (textiles, cosmetics), Oecoplan (other non-food and services) and Max Havelaar (fair trade products), in million Swiss Francs (CHF)



Source: COOP Switzerland

Even though the consumption of organic products in general is already at quite a high level, a COOP buyer responsible for frozen products estimates a further increase in the future. This is especially true for organic seafood as the market is still underdeveloped compared to other sectors. COOP is currently looking for suppliers of organic cod, flounder, turbot, plaice, halibut, salmon, seabream, seabass, arctic char, tilapia, pangasius, shrimps and mussels amongst others. Some first contacts with producers have already been established to develop such products.

Retail giant Migros currently offers organic Scottish salmon in fresh or smoked forms and also cooked and peeled Ecuadorian shrimp. As mentioned earlier, Switzerland produces some 220 mt per year of organically raised trout, certified by Bio Suisse.

Retail prices for some value added organic products in CHF/kg are as follows: Rainbow trout, eviscerated 25.50; smoked fillets 59.90; fillets 45.90; whole, smoked, 37.90; Salmon trout: marinated smoked fillet 84.80; fillet 57.70; smoked fillet 79.50. Preparations: Ravioli 59.90; smoked trout mousse 180g 14.80/300g 21.40; trout terrine 180g 15.30/300g 22.30; trout in olive oil 150g 17.90; trout in vinegar 150g 15.90/400g 33.50; trout soup 5dl 11.70. Swiss per caput seafood consumption was 14.8 kg in 1999.

United Kingdom

POPULATION (1,000)	**59,495**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**20.0**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**1,192,245**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**956,934**

Cod, salmon and haddock represent about 64 percent of UK fresh fish sales. Less than 20 percent of all British families purchase organic products on a monthly basis or more often. UK produces organic salmon, trout and the preparation of standards for mussels is under way. In 2003, organically produced salmon represented about 2 percent of total salmon production, but consumers seem to prefer organic

trout. The volume of organic exports from UK is relatively small. Organic salmon is exported principally to France and to a lesser extent to Switzerland and Germany.

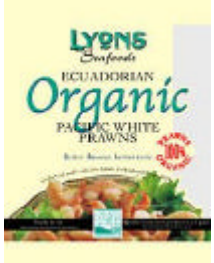
Regarding import procedures commission agents are comparatively rare in the British fish import business. In general, importers purchase whole shipments particularly of frozen products and sell onward to processors or wholesale distributors. Independent retailers are rapidly declining in importance as more people shop at supermarkets. Thus distribution is rapidly becoming more centralised. The Billingsgate market in London also admits losing its importance as a traditional wholesale market for the above reasons, and is in fact becoming increasingly involved in retail trade.

Traditionally the leading players in the sector were Young's, Lyons Seafoods, MacFish, Bluecrest and Sea Products International, covering a wide range of fresh and frozen seafoods, including more specialized products such as shrimp and squid, together with Unilever under its Bird's Eye brand. Recently however there have been a number of mergers and acquisitions which has reduced the number of major players. The canned fish market is dominated by two brands John West (Heinz) and Princes (Mitsubishi). These manufacturers account for more than 60 percent of the market.

The majority of food purchases in UK are made at supermarkets and they are now the key sales outlets for fish and fish products. Their market share is growing, largely at the expense of independent fishmongers. However, wet fish counters are not being lost, rather they are being transferred to the supermarkets. Wet fish counters are now present in most large supermarkets and are supported by cabinet displays of chilled and frozen fish.

The Seafood Company offers ready-to-eat organic king prawns and Anchor Seafoods sells freshly cooked and peeled prawns, both are from South America. The first is sold at Tesco (US$ 4.77 for a 125g pack), the latter at Waitrose (US$ 5.57 for a 125g pack). 'Organically-sourced prawns are still very new to UK consumers and some of the first products on the market were disappointing,' comments the Seafood Company's marketing director. 'With our entry into the organic sector, a major priority has been to offer a product that fully delivers in terms of eating quality and price point as well as integrity'. Organic shrimp have now become a success story – with year-on-year gains of 40 percent. Apart from the supermarkets, some food processors such as sandwich-makers are also supplied by Anchor Seafood.

Macrae Food Groups are major sector suppliers for organic seafood products to the leading UK Retail Multiples and the wholesale and food service sectors.



Marks & Spencer has recently introduced UK produced fresh organic salmon fillets at £4.79 for a 265 g pack.

Scottish Quality Salmon is an organization set up by the salmon industry representing about 65 percent of the farmed tonnage produced in Scotland. Scottish salmon was the first fish and first non-French product to receive the Label Rouge in 1992.

The comparatively high proportion of organic salmon production in Scotland is also considered to be a strategy to defend a market that is increasingly flooded by cheap products from Chile and Norway. Organic production is a way to diversify supply by creating a high quality niche product. UK per caput consumption of fishery products reached 20 kg in 1999.

6.3. JAPAN

POPULATION (1,000)	**126,821**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**64.8**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**8,214,310**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**4,254,279**

Japan's per capita seafood consumption is the highest worldwide standing at 64.8kg in 1999. Japan is one of the world's three largest shrimp markets, importing about 90 percent of its needs from other Asian countries.

Alter Trade Japan (ATJ) has supplied 'eco-shrimp' to Japanese retail outlets since 1992, a product that is grown in extensive farms in Indonesia.. The 100 percent traceable processing of the product also takes place in Indonesia, in order to avoid any further repacking/refreezing and subsequently quality losses. This includes removal of the heads, size grading and individual quick freezing. Currently the 'eco-shrimp' imports (about 300 mt per year) represent about 0.1 percent of Japan's total shrimp imports

About 30 mt of individually quick frozen shrimp have been exported to the Swedish Coop since November 2002, also respecting Fair Trade aspects. Marketing expert Mr. Yogiantoro from ATJ's subsidiary company Alter Trade Indonesia (ATINA) explains that the UK market represents the next target for about 10 mt of annual exports. Mr. Yogiantoro predicts an increasing demand for his products up to 150 metric mt per year. Currently only 10 percent of the available 15,000 hectares in the Indonesian ATINA production area are involved in organic production – leaving a big potential for conversion in order to satisfy this growing market

It is important to note, however, that Japan's population is expected to decrease over the next decades, which may have a negative impact on future demand.

6.4. OTHER COUNTRIES

Canada

POPULATION (1,000)	**30,492**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**23.6**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**719,967**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**631,128**

One Canadian company is currently involved in organic salmon production in Chile (see below), destined to the Canadian and US market. The US based natural food retail chain Wild Oats, whose seafood sales are currently growing at 32 percent, represents one of the major distribution channels for organic seafood in Canada.

China

POPULATION (1,000)	**1,242,761**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**25.1**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**31,228,420**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**761,327**

Although the Chinese government has developed organic aquaculture standards there does not seem to be any substantial level of production for the moment. However, according to INOFYU, there seems to be a great potential for future production, as domestic as well as international demand is increasing. Furthermore, the Chinese government is promoting sustainable production methods. According to the Chinese Organic Food Development Centre, the price premium for organic shrimp at retail level in China varies between 50 and 87 percent.

Ecuador

POPULATION (1,000)	**12,411**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**7.0**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**87,333**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**4,060**

The Ecuadorian shrimp production is destined to the European and US markets. The shrimp farm Expalsa identifies the US market as a target for expansion of organic shrimp sales in 2004. Biocentinela's annual sales of organic shrimp to the European market amount to US$ 1 135 000 annually. Main partners are the UK chains Tesco, Marks & Spencer and Waitrose and COOP in Switzerland. While expecting to obtain the US Certification of Aquaculture Production Processes for Seafood Buyers this year, the US market represents the next challenge for Biocentinela exports. The expectations for the future are optimistic. The production volume has more than doubled in the last two years, increasing from 7 mt per month in 2002 to 15 mt per month in 2004.

Israel

POPULATION (1,000)	**5,910**
PER CAPUT SUPPLY OF FISHERY PRODUCTS (KG)	**20.9**
TOTAL SUPPLY OF FOOD FISH PRODUCTS (MT IN LIVE WEIGHT)	**123,528**
IMPORT OF FISHERY PRODUCTS (MT IN LIVE WEIGHT)	**99,332**

According to the manager of the tilapia producing Kibbutz Geva, the domestic market isn't yet mature for organic products, whilst European demand keeps on growing. In fact, this year the production should double. Kibbutz Geva used BioFach 2004 in Germany to test the market for new organic

ready-to eat products. These consist of breaded fingers or balls made of different fish species farmed organically. Some of the bread crumbs contain different herbs or spices.

7. CONCLUSIONS

Some significant points regarding the organic market have emerged in this overview:

- The organic market is mainly located in the United States, Europe and Japan
- The organic market is growing
- Organic products are distributed increasingly through supermarkets
- Uncertain legislation restricts organic market expansion
- Demand for organic aquaculture products exists, but the supply base is narrow

Considering these points, market opportunities for organic aquaculture products seem to be positive in developed countries. Organic aquaculture can in fact be considered to be the first potentially important horizontal segmentation of the aquaculture sector, characterised by a category of 'value-added' aquaculture products not linked to any specific fish specie or type of product.

Aquaculture producers in developing countries may have an important role in the establishment of this very new sub-sector. Direct supply agreements between producer groups in developing countries and distributors in the destination markets can facilitate the achievement of a critical mass for supply.

It is obvious that continued growth of production helps the development of the sub-sector; more production provides stability of supply, which helps new market initiatives and encourages processing industries to invest and expand capacities. More production also decreases the disadvantages of small volumes in the whole distribution chain, which can lead to lower costs, lower consumer prices and increased willingness to buy organic. Distribution through conventional supermarkets provides a better visibility for organic products and facilitates the attraction of occasional consumers.

On the supply side, one key need for the future is to overcome the fragmentation of the certification sector and to develop a coherent system for certification, monitoring and evaluation of organic production methods, which constitute the basis for building consumer confidence. The promotion of a fair and transparent trading system must be based on the certification of compliance with established authentic standards. Joint efforts from all stakeholders to increase creditability are essential.

With regard to demand, there is a need to educate and inform consumers about organic products in order to influence the perception of and the attitude towards higher prices. Transparency should be one of the guiding principles for organic aquaculture production. In the growth of the organic sector, whether in marketing, research projects or policy initiatives, the basic idea of organic production, its vision, must be visible. Marketing tools focussing on the positive aspects of organic products are needed. A harmonized marketing strategy involving the various stakeholders could facilitate communication and consumer information on organic aquaculture products.

The future consolidation of organic aquaculture in international markets will depend, in particular, on developing ways of co-operative management that take into consideration the interests of organic aquaculture producers, processors and traders as well as consumers' needs. However, it should be kept in mind that organic aquaculture will most probably remain a restricted segment of the aquaculture sector serving a high quality niche market.

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ANNEX I - PRODUCER DETAILS

COUNTRY	NAME	ADRESS	PHONE	FAX	E-MAIL/WEB	CONTACT	PRODUCT	ACTIVITY	SOURCE
Chile	Fiordo Blanco	Pacheco Altamirano 2779 Puerto Montt	+56 65258057	+56 65251327	bdrope@fiordoblanco.cl		Salmon	Production	Naturland
Ecuador	Biocentinela (Ecuador-Peru Organic Shrimp Producers and Exporters Association)	Urdesa Circunvalacion Norte 228A Guayaquil, Guayas, Ecuador	+593 (4) 2380312 (4) 2381552	+593 (4) 2883803	k.s@biocentinela.com Jorge.hoyos@biocentinela.com Javier.Barragan@biocentinela.com www.biocentinela.com	K. Santistevan, Comm. J. Hoyos, Man. Javier Barragan	White shrimp	Production	Naturland
Ecuador	Expalsa	Km 6 1/2 Via Durán Tambo Guayaquil, Guayas, Ecuador	+593 (0) 4804200 (0) 42801234	+593 4 2801150	expalsa@expalsa.com www.expalsa.com	J.J. Cordovéz B. Viertl Bujard	Shrimp	Production Export	Naturland Wonder Org. Shrimp
Ecuador	Empacadore Mar Grande		+593 (0) 5398486		mgrande@uio.satnet.net	C. Ruperti			
Ecuador	Camarón Poseidon		+593 (0) 05692097		achtour@telcon.net	F. María Dueñas			
Ecuador	Marplantis	Cdls Miraflores Calle 1ra #208 entre Guayas y Central Guayaquil	+593 94500508	+593 42202037	mjesus@gye.satnet.net mechitamolina@hotmail.com	M. Molina Admin. Manager	Shrimp	Production	
Ecuador	Barquero/Vergel Camaronera	Av. 8 Calle 20 No. 1925, Casilla 1305450 Manta, Manabi	+593 (0) 52621593		gian_zanchi@hotmail.com		Shrimp	Production	Naturland
Ecuador	Bravito Pesquero Industrial S.A.	Circuvalacíon Sur Oeste, Barrio Los Pinos Machala, El Oro	+593 (0) 727933338		bravito@ecua.net.ec adewind@ecua.net.es		Shrimp	Production	Naturland
Ecuador	LANPAC Langostinos del Pacifico	Urbanización Unioro Mz.2, Villa 12 Machala, El Oro			boa_pereira@hotmail.com _		Shrimp	Production	Naturland
Ecuador	South Tropical S.A.	Jose Mascote #701 y Quisquis, Primer Piso Ofc #2, P.O. Box 09, 01 1124 Guayaquil, Guayas	'+593 42290936		ebolona@southropical.com		Shrimp	Production	Naturland

France	La Ferme Aquacole du Planturel						Trout	Production	Ecocert
France	Ferme Marine de L'Aber-Wrac'h	EARL Fontaine, Paluden 29870 Lannilis	+33 '0608460204	+33 02.35.28.71.31	fontaineaberwrac@aol.com www.saumonbio.com		Salmon, Trout	Production	Ecocert, AB
France	Safa	130, rue de Rosny 93100 Montreuil					smoked salmon	Processing	
France	Armoric S.A.	55, Avenue de Kéradennec 29556 Quimper Cedex 9						Processing	
France	Les Viviers Cathares Sarl	Philippou-Montbel 11230 Rivel						Processing	
Germany	Ristic AG	Am Espen 15 90559 Oberferrieden	+49 (0) 91834090	+49 (0) 918340949	bioshrimps@ristic.com www.ristic.com	Mr. Jochim	Shrimp	Processing	Green Aqua Bio Shrimp
Germany	Feinfischräucherei Josef Wechsler	Wildweg 6 50374 Erftstadt	+49 (0) 22356019	+49 (0) 2235 71118	info@erftland-forelle.de www.erftland-forelle.de	J. Wechsler	Trout, salmon	Smoking	Natuland
Germany	Fischzucht A.Pilgram	Kieselhöhe 15 53797 Lohmar	+49 (0)22464268	+49 (0)22466388	andreas.pilgram@t-online.de www.fischzucht.net	A. Pilgram	Carp	Production	Naturland
Germany	Fischzucht Auf der Bleiche	Rosenmühlenweg 89415 Lauingen	+49 (0) 9072922599	+49 (0) 9072921249	fischzucht@fisch-freaks.de www.fisch-freaks.de	Fam. Bretzinger	Trout	Production Processing	Naturland
Germany	Fischzucht Becker	Lippische Str.21 33604 Bielefeld	+49 (0) 5212702811					Production	Naturland
Germany	Fischzucht Wasserwiesen	Wasserwiesen Nr. 6 83026 Rosenheim	+49 (0) 8064631	+49 (0)8064 8185				Production	Naturland
Germany	Fürstenwald Räucherei und Fischzucht Nuber	Obere Wiesen 1 88416 Ochsenhausen	+49 (0) 73521811	+49 (0) 73527293	info@fischnuber.de wwww.fischnuber.de	Herr Nuber Herr Voigt	Trout	Production Smoking	Naturland
Germany	Laschinger GmbH	Birkenthal 8 94253 Bischofsmais	+49 (0) 992094000	+49 (0) 9920940023	info@laschinger.de www.laschinger.de	A. Maak, H. Hain, J. Laschinger	Salmon	Production Smoking	Naturland

Germany	Fischzucht Koslowsky	Lugdalstr. 13 59590 Geseke	+49 (0) 1722361549				Trout	Production	Naturland
Indonesia	PT. Alter Trade Indonesia ATINA	Taman Pinang Indah BB IV/6 Banjar Bendo Sidoarjo-East Java Indonesia 61251	+62 (0)318052525	+62 (0)318052524	atina@sby.dnet.net.id www.altertrade.co.jp	M. Yogiantoro Marketing	Shrimp	Production	Naturland
Israel	Kibbutz Geva Organic Fish Project	18915 Kibbutz Geva	+972 (0) 46535887 (0) 66633301	+972 (0) 46535887	omrilev18915@yahoo.com -	O. Lev	Tilapia, ready-to-eat products, fillets skinless, deboned	Production Processing	Naturland
Ireland	Clare Island Seafarm	Feirm Farraige Oileán Teo, Cloghmore, Achill County Mayo	+353 (0) 9845375	+353 (0) 9845378		B. Clarke D. Beard	Salmon	Production	French label Naturland
Ireland	Cuan Baoi Seafarms Ltd.	Ballyhea Dingle, Ei Nor County Kerry	+353 (0) 6651139	+353 (0) 669151133		M. Sammon	Salmon	Production	Naturland
Ireland	EISC Geal Teo	Emlagh, Lispole County Kerry	+353 (0) 669151743	+353 (0) 669151804	eiscgeal@eircom.net	J. O' Driscoll	Salmon	Production	Naturland
Ireland	Mannin Bay Salmon Co. Ltd.	Drinagh,Errislannan, Clifden County Galway	+353 (0) 9521262	+353 (0) 9521773	mansal@eircom.net		Salmon	Production	Naturland
Ireland	Ummera Smoked Products Limited	Inchybridge, Timoleague, Co. Cork, Ireland	+353 23 46644	+353 23 46419	sales@ummera.com www.ummera.com		Salmon	Production	
Ireland	Knivara Organic Smoked Salmon				info@kinvarasmokedsalmon.com www.kinvarasmokedsalmon.com		Salmon	Production	
Italy	Cultivar srl	Via Staffali 18 37062 Dossobuono (Verona)	+39 (0) 45986377	+39 045986744	cultivar@cultivar.it www.cultivar.it		Seaweed		
Japan	Alter Trade Japan ATJ	Sunrise Shinjuku Bldg. 3F, 2-4-15 Okubo, Shinjiku-ku, 169-0072 Tokyo	+81 (0) 52738163	+81 (0) 352738162	suwidji@altertrade.c.jp www.altertrade.co.jp	M. Ueda Sales & Busin. Operations	Shrimp, Prawn	Production	Naturland
New Zealand	Sealord Group						Greenshell mussels	Processing Marketing	

New Zealand	Ocean Organics	4 Fraser St Paeroa			jill@OceanOrganics.co.nz www.oceanorganics.co.nz		Seawead, algae	Production Processing	
New Zealand	New Zealand Clearwater Crayfish Ltd.	P.O Box 1260 Nelson	+64 (03) 5467103	+64 (03) 54677107	koura@clearwatercrayfish.co.nz dsmythe@clearwatercrayfish.co.nz www.clearwatercrayfish.co.nz		Crayfish	Production	AgriQuality CERTNZ
New Zealand	Ormond Aquaculture Ltd.	Wairau Valley R.D. 1 Blenheim	+64 (03) 572 2770	+64 (03) 572 2768	salmon@clearwatercrayfish.co.nz www.clearwatercrayfish.co.nz	Perter & Coreen Wilhelmus	Salmon	Production	AgriQuality CERTNZ
Peru	Natural Farm	km 8 Carretera Base Naval El Salto, Tumbes	+51 74608153		luchoseragaki@hotmail.com		Shrimp	Production	Naturland
Spain	Piscifactoria Sierra Nevada S.L.	Camino de la Piscifactoria 2 18313 Riofrio, Loja, Granada	+34 958 322621	+34 958 322114	piscisnevada@ingenia.es www.caviarderiofrio.com	F. Domezain	Trout, Caviar, Storgeon, smoked, fresh, cremes, paté	Production	CAAE
Switzerland	Forellenzucht Blausee	3717 Blausee	+41 (0) 33672333333	+41 (0) 336723339	info@blausee.ch www.blausee.ch		Trout	Production	Bio Suisse
Switzerland	Fischzucht August Nadler	5032 Rohr	+41 (0) 628223370	+41 (0) 0628223171					Bio Suisse
Switzerland	Piscicoltura Pura SA	6984 Pura	+41 (0) 916061631	+41 (0) 916061631					Bio Suisse
Switzerland	Forellenzucht Rubigen	3113 Rubigen	+41 (0) 317214111	+41 (0) 317214506			Trout		Bio Suisse
Switzerland	Piscicolture du Vieeux-Moulin	1148 L'Isle	+41 (0) 218645272	+41 (0) 218645240					Bio Suisse
Switzerland	Mias Forellenzucht	9053 Teufen	+41 (0) 713331379	+41 (0) 713331844			Trout		Bio Suisse

Switzerland	Forellenzucht Roland Flückiger	4813 Uerkheim	+41 (0) 627213566				Trout		Bio Suisse
Switzerland	Forellenzucht Heinz Glauser	8164 Bachs	+41 (0) 18580907				Trout		Bio Suisse
Switzerland	ARIS Aquafood SA	6558 Lostallo	+41 (0) 765630410						Bio Suisse
Switzerland	Piscicolture Jacky Perrin	1874 Champéry	+41 (0) 244791472	+41 (0) 7964363					Bio Suisse
Uganda	Greenfields Ltd.	Plot 15/17 Mirza Road P.O. Box 667, Entebbe	+256 (0) 41321141 (0) 41320716	+256 (0)41321386	www.greenfieldsuganda.com	P. Borel, M. van derMeer, G. Mwase	Nile perch, tilapia, filllets, whole	Production Processing	
UK	Cerne Valley Trout Farm		+ 44 (0) 1929463295				trout	Production	
UK	Deverill Trout Farm				www.purelyorganic.co.uk		trout	Production	
UK	Hawkshead Trout Farm		+44 (0) 1539436541		trout@hawkshead.demon.co.uk www.organicfish.com		trout	Production	
UK	Prestigne Trout Farm		+ 44 (0) 1544267085				trout	Production	
UK	Trafalgar Trout Farm		+44 (0) 1725510448		www.trafish.com		trout	Production	
UK	Balta Island Seafare Ltd.		+44 (0) 1224626261		salmac@mes.co.uk		salmon	Production	Soil
UK	Mainstream Std.				www.aquascot.com				

UK	Lyons Seafoods Ltd.	Barrow House, Bishopstrow, Warminster Wilthsire BA 12 9HU	+44 (0) 1985 214565		www.lyons-seafood.com		Prawns	Production	
UK	Glenrossan Fish Products	50 Aughaboy Road, Omagh, Co. Tyrone BT79 7QS Northern Ireland	+44 (0) 2881648135	+44 (0) 2881648013			salmon	Production	
UK	Aquascot	Alness, Highlands, Scotland, IV17 0UP	+44 (0)1349 899000	+44 (0)1349 883893	service@aquascot.com www.aquascot.uk.com/organic.htm		Salmon		
UK	Graig Farm Organics	Dolau, Llandrindod Wells Powys LDl 5TL	+ 44 (0) 1597 851655	+44 (0) 1597851991	Salmonweb@graigfarm.co.uk www.graigfarm.co.uk		salmon, trout	Production	
UK	Westray Samon Ltd.								
USA	Permian Sea Shrimp Co.	P.O. Box 448 Imperial, TX 79743	+1 (915) 5362216	+1 (432) 5362216	pssc@west-tex.net www.permainseashrimp.com	P. Reid	Shrimp	Production	
Viet Nam	State owned Enterprise 184	CASEP, Ca Mau Fishery Management Office 20a Nguyen Tat Thanh St. Ward 8 Ca Mau St.	+84 780831068	+ 84 780835758	cafish@hcm.vnn.vn	N. Van Duyen	Shrimp	Production	Naturland

ANNEX II – BIO SUISSE DIRECTIVES

The requirements for organic fish breeding in accordance with the BIO SUISSE standards have been developed in a two year long cooperation with practicing fish breeders, fish food producers, organizations for the protection of animals and fish experts from Switzerland and abroad and adopted by BIO SUISSE in July, 2000.

Production of edible fish

Art. 3.11.1 ff

Directive of the label-commissions «Production» (LCP) of 25/07/2000

1. GENERAL RULES

1.1 Reproduction/Breeding

a) Purchased young fish and eggs must come from other organic operations. Young fish must be produced either in Switzerland or in the adjacent countries. Until December 31, 2005, the purchase of non-organic young fish and eggs is allowed. In this case, the supplier must confirm that the young fish meet the general requirements of organic farming (see example in the appendix of this directive).

b) The fish must have been bred at least 2/3 of their life on the organic operation in order to be sold as fully organic.

c) Warm breeding, inspected hatching and initial feeding of the brood are allowed (thereby an energy concept providing for economically bearable economy measures and possibilites of the use of renewable energy sources, as well as closed water cycles must be submitted).

d) The permitted anaesthetics for the stripping off are listed in the «list of auxiliary inputs for fish-farming».

1.2 Pond/Fish Farm

a) The fish farm must be looked after daily.

b) The ponds must be secured against the escaping of the fish, respectively against the incoming of fish from outside, particularly in the case of non endemic fish species (eg. rainbow-trout).

c) Fish farms must identify 7% of its surface as compensatory ecological areas (see art. 2.4.1 of BIO SUISSE standards). Aquatic areas (such as marshland, reeds, frog ponds) must preferably be created. Net cage operations in open water are exempted of this obligation.

d) The ponds must be equiped with retreating facilities and shelters and favour a behaviour of the fish in accordance with the physiological and behavioral needs of each species (eg. constitution of swarms, territorial behaviour). Pools can be structured by screens hung into the water (easily removable for cleaning). The requirements of the structuring of the ponds can be increased on the basis of new ethological findings.

e) If water is taken out of a creek for the breeding in ponds, the legal requirements with regard to residual water quantities must be complied with. The creek must be passable for fish respectively made passable in case of newly built equipment.

1.3 Water quality

a) Inlet and outlet: The inlet must not be (or only little) charged anthropogenously. In case of doubt, eg. if the inlet comes from intensively farmed areas, the harmlessness must be proved with water samples. The LCP can define additional requirements of the water quality of the inlet. The water quality of the outlet must at least meet the requirements of the Swiss Ordinance on Water Protection (requirements for fish farms). If necessary, the floating substances must be retained in a deposit pool. The water quality must be permanently checked by means of water samples of the in- and outlet (at least twice a year, partcularly in case of low water-level and after heavy precipitation).

b) Ponds: Temperature, pH, oxygen and ammonia content of the water must be adapted to the specific needs of each fish species and must be measured in regular periods adapted to the conditions (at least once a month) and at the problematic hours of the day.

c) For the oxygen enrichment of the inlet or of the ponds, the following measures are allowed: cascades, sieve towers, water-wheels, fountains, circulating pumps. An artificial ventilation of the installation with BIO SUISSE directives Edition of 1st January 2001 2 liquid O2 is not allowed, respectively may only be carried out temporarly and in exceptional cases in extreme weather conditions (obligation to register with LCP), for transporting aims and for the breeding of young fish in breeding houses.

d) Sedimented foodstuff residues or faeces must be taken out and be handed over to another organic operation within a distance of 20 km. If there is no organic operation within this distance, the substances may be handed over to a non-organic farm operation or an organic operation farther away with the authorization of the LCP.

1.4 Feed

a) For feed production, the extruding technology is allowed.

b) For quality and health reasons, the fat content of the feed must not exceed 15%.

c) The coloring additives in the feed must be natural substances (eg. shrimp shells, phaffia-yeast). Its use must be declared when the fish are sold.

d) Otherwise art. 3.1.7 – 3.1.9 and art. 3.11.5 of the BIO SUISSE standards apply. As for feed labelled with the «BUD for auxiliary inputs», the respective directive applies. Fishmeal or fishoil produced according to art. 3.11.5 is classed with the organic part. On the other hand all vegetable parts of the feed must come from organic farming.

1.5 Hygiene and health

a) Mechanical-physical methods (cleaning with high pressure) are preferable. Burned lime may be used to disinfect the ponds. The use of chlorinated lime is explicitely forbidden.

b) The permitted agents to disinfect containers and equipment as well as for the self-treatment of the fish are listed in the «list of auxiliary inputs for fish-farming».

c) Chemotherapeutic treatments may only be carried out upon consultation with a veterinarian who is specialized on fish farming or with the FIWI (Center for Fish- and Game Medicine of the University of Berne). See also art. 3.1.11 of the standards.

d) Dead fish must be immediately removed from the ponds.

1.6 Husbandry

a) Sorting and handling measures and the time during which the fish are kept outside of the water must be reduced to a minimum. The use of sorting machines is allowed. The fish and all surfaces coming into touch with them must permanently be kept wet.

b) The fish must have the possibility to find shady water areas. At least 10% of each pond must be shaded in permanence.

c) The density of the stock must be regulated in a way that does not impair the health of the fish or behaviour in accordance with the physiological and behavioral needs of each species. Quantitative limits of the stock are defined in the (species)-specific rules (chapter 2 of this directive).

d) A long keeping time of the fish is of great importance for a good meat quality of the fish and prevents a too intensive husbandry. A minimum keeping time is therefore stipulated in the (species)-specific rules.

1.7 Harvesting

The killing of the fish must be carried out in the water or immediately after taking the fish out of the water. It is particularly forbidden to let them choke. The fish must be gutted and processed immediately after killing.

1.8 Registering/Inspection

a) A fish journal must be kept. All hygiene-, treatment-, sorting- and handling measures as well as the recorded water quality must be registered therein. The indications of the stock density must be updated at least once a month. The fish journal must be permanently updated and submitted at the inspection. BIO SUISSE directives Edition of 1st January 2001 3

b) At the first inspection, the cubic measures of the ponds and the corresponding limits of the stock density are investigated and defined.

1.9 Processing and marketing

The processing must be carried out in compliance with chapter 5 of BIO SUISSE standards and with the LCPM-directive for processing «2. Meat and meat products». In addition, the directives «on-farm processing and purchase of organic products» and «direct marketing» must particularly be complied with.

2. (SPECIES)-SPECIFIC RULES

2.1 Breeding of carnivorous lake-/sea-fishes (swarmfish, eg. perch, lake char in ponds and netcages

a) Netcages: Only species living in the respective lake, river or other stretch of water may be kept in netcages. It must be made sure by means of regular checkings that the macro-fauna around the net remains intact. The net must not be water proofed with synthetic agents.

b) Max. stock density: 20 kg/m3

c) Min. keeping time: perch: 6 months, salmonides: 18 months

2.2 Breeding of carnivorous running water fishes (eg. brown trout, rainbow trout, river char) in ponds

a) The fish must be kept as far as possible in natural ponds (i.e. with at least a complete natural floor area). The keeping in artificial containers (synthetic or concrete pools) is allowed maximally during half of the lifespan of the fish. The containers must be equiped with habitat features (shelters, running and still water areas; see also point 1.2 d) of this directive).

b) Max. stock density: 20 kg/m3. In running water ponds the stock density may be increased up to max. 30kg/m3, if max. 100kg fish are kept per l/sec of the inlet.

c) Min. keeping time: salmonides: 18 months

2.3 Breeding of cyprinides (carp-farming in ponds)

a) The carps must be kept in natural ponds (including natural bank areas). Only the keeping of smolts for initial feeding and the conditioning of edible fish are allowed in artificial containers.

b) The stock should ideally consist of various fish species.

c) In case of fertilizing, only fertilizer from organic farming may be used. In exceptional cases, stone meal or carbonated lime may also be used.

d) Max. stock densities of carps and tenches: 3000C1/7000T1 respectively 600C2/2500T2 respectively 1500T3 per ha.

e) Feeding: The basis of the fish increase is the natural production of the pond. At least 50% of the increase must be achieved through the natural offer of feeding stuffs. For the complementary feeding only the following feeding stuffs are allowed:

- Vegetable organic feed. In case of non-availability, max. 10% of the dry matter (DM) of the whole ration may be non-organic.

- For the rearing of the brood and additional feeding, max. 10% of the dry matter of the whole ration may consist of fishmeal/fishoil. The origin of the fish meal must comply withart. 3.11.5 of the BIO SUISSE standards. The rearing of the brood is limited to the first summer, the additional feeding to the adolescence (C1 and C2), during max. 2 weeks in spring and 3 weeks in autumn (detailed documentation in the fish journal).

Example

CONFIRMATION FOR NON-ORGANIC YOUNG FISH AND EGGS

By signing this agreement, the supplier confirms that the delivered non-organic young fish/eggs have not been subject to any of the below mentioned treatments, respectively do not present any of the below mentioned distinctive marks. In case of untrue indications respectively non-compliance with the present agreement, the supplier can be made liable for compensation. The supplier is particularly liable for damages, if the supply of non-conformous young fish/eggs results in sanctions against the purchaser.

Not permitted distinctive marks/treatments:

- **Genetically modified eggs or eggs deriving from polyploidization, ray treatment (monosexing) or gynogenesis.**
- **Young fish from countries outside Switzerland and its adjacent countries.**
- **Prophylactic treatment with chemotherapeutics, antibiotics or hormones.**
- **Feeding with antibiotics, growth promoters, hormones, genetically modified feed, feed components or additives.**

young fish/eggs (species)	delivered number	date of delivery	Signature

Purchaser of young fish/eggs:

Name, Surname:…….…. No of the operation:……..…...……..
Address, place:……

Supplier of young fish/eggs:

Name, Surname:…….....
Address, place:……..

Place, date and signature of the supplier: ..…….
This form must be kept in the operation

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