Comments submitted by Thailand

Agenda Item 3

Revised Proposed Draft Standard for Fish Sauce
(Prepared by Thailand and Vietnam)

Background

1. The 30th session of Codex Committee on Fish and Fishery Product (30 October 2009) agreed to advance the Proposed Draft Standard to Step 5 for adoption by the 33rd Session of Codex Alimentarius Commission (CAC).

2. At the 33rd session of CAC, A delegation, while supporting the adoption of the proposed draft standard at Step 5, proposed that further consideration should be given to the deletion or amendment of the pH value in section 3.4 chemical properties as there was no clear reason for the current provision of pH value and that the value should be evaluated based on scientific data for food safety and technical justification for food quality. In addition, the delegation proposed that the section on contaminants be revised to include subsections on biotoxins and Maximum residue limits for pesticides and/or veterinary drugs.

3. The Committee adopted the proposed draft standard at Step 5 and agreed that technical comments should be submitted to the Committee on Fish and Fishery Products for consideration.

Thailand and Vietnam highly appreciate comments from member countries (USA, Japan and the Philippines) made in the 33rd CAC.

4. We would like to make clarifications on the afore-mentioned aspects raised in the 33rd session of CAC and the responds to comments from CL-2010/26-FFP as the followings:

Section 3.1: Raw material
3.1.1 Fish

In Thailand and Vietnam, the largest producing countries of fish sauce, best quality fish sauce is produced from fermentation of anchovies. Almost all of fish sauce available commercially in the countries and international markets is obtained from this fish species. Anchovies are pelagic fish and their fishing grounds are far away from the shoreline. These areas are least likely or unlikely affected by red tides, meaning the possibility of biotoxin contamination is very low to none. The Thai Department of Fisheries (DOF) has conducted monitoring studies on biotoxin occurrence in Anchovies in its waters. The studies addressed Saxitoxin (STX), Domoic acid (DA), Tetrodotoxin (TTX) and Diarrhetic Shellfish Poisoning Toxins (DSP). None of the toxins was found in the samples collected. However, as it was concerned by several delegations, and anchovies in other geographical areas have been found to contain some toxins, it is agreed to add the suggested texts in this Section as follows:

3.1.1 Fish

Fish sauce shall be prepared from sound and wholesome fish in a condition fit to be sold fresh for human consumption.

[Certain fish from some geographical areas have been found to accumulate biotoxins. It is up to the competent authority in the producing country to determine whether this risk exists in any geographical areas under their control and if so, put in the necessary mechanisms to ensure that fish parts used comply with the any applicable Codex requirements.]

Note: The above texts suggested by the US delegation needed to be placed in square brackets in the meantime as the Japanese delegation also suggested similar wordings in Section 5: Contaminants. The Committee is requested to comment on the appropriate place for the proposed texts.

Section 3.2: Other ingredients

In response to the comment made by the US delegation that the text should read “Any other ingredient used to assist the fermentation process shall be of food grade quality and conform to all applicable Codex standards,” the original text “All other ingredients used shall be of food grade quality and conform to all applicable Codex Standards,” was intentionally written that way to be in line with other Codex Fish and Fishery Product Standards. Furthermore, the ingredients referred to are not only added for the purpose of assisting fermentation but also for flavor or colour improvement of fish sauce such as sugar.

Therefore, we propose to have the text remained as it was.
Section 3.4: Chemical properties

In response to the comment on pH value in this Section, we would like to clarify as follows:

The objective of specifying pH in this draft standard is to differentiate between good and low quality fish sauce. It is widely aware that good quality fish sauce can only be produced from good quality raw material. Fish flesh is mainly composed of protein where pH of fresh fish is neutral. After fish dies, decomposition occurs through enzymatic digestions of fish muscle and gradually increased the pH of the flesh. There are a number of products obtained from protein and non-protein nitrogen digestions such as amines and ammonia. These products change the properties of fish muscle to low basic or alkaline properties.

From research studies conducted by Thai DOF and Department of Fisheries, MARD, Vietnam, on fish sauce samples collected from large and small scale commercial fish sauce factories, the pH of good quality fish sauce will range between 5-6.5. Fish sauce with pH falls below 5 could be produced from acid added fermentation or acid hydrolysis which is not covered by this draft standard.

The proposed pH range in the draft standard, therefore, will reflect the quality level of fish sauce and protect consumers. However, Thailand does not object the deletion on the requirement on pH if suggested by the Committee.

Section 3.6 Decomposition

Regarding the comment made by the EUMS to add this new section on Decomposition, we would like to clarify that the process of fish sauce is rather different from other types of fishery products. Salt of at least 20% by weight is added to fish in the fish sauce processing. At this salt level, the growth of spoilage bacteria is completely inhibited. Therefore, we are reluctant to add this new section on decomposition to the draft standard.

Section 5: Contaminants

The Japanese delegation proposed the texts in square brackets concerning biotoxins in this Section as follows:

5.1 The products covered by this Standard shall comply with the Maximum Levels of the Codex General Standard for Contaminants and Toxins in Foods and Feed (CODEX/STAN 193-1995).

[5.2 Raw materials for fish sauce may not contain biotoxin (e.g. Ciguatoxin, Tetrodotoxin and PSP) in such amount that may present a risk to human health]
Section 6: Hygiene

We would propose to maintain the histamine level in this Section at the level of 400 ppm or 40 mg/100 g. Firstly, the risk assessment results on histamine in fish sauce submitted by Thailand showed that there was no difference in the effect of histamine at 200 and 400 ppm. The risk assessment was performed based on more than 10,000 records of most recent data consumption of Thailand, the country known to consume fish sauce at the highest rate and on a daily basis. Fish sauce is eaten as a condiment and in a small amount at a time. The risk of histamine intake and histamine poisoning received from consuming canned tuna or other scombroid fish is much higher. This risk assessment study has been submitted to the Food and Chemical Toxicology Journal and is in the process of editing. It is expected to be published by the end of this year.

Secondly, the fermentation process has been found from various studies to increase histamine in the production of fish sauce. Thai DOF conducted experiments by monitoring the changes in histamine content in several commercial fish sauce processing establishments, from start of fermentation (of fish and salt) (month 0) to the end of the production (month 12). The histamine was found to increase with fermentation time. Salt is thought to be a catalyst for histamine formation in addition to other factors which are 1) level of free histidine 2) contamination levels of histidine decarboxylating bacteria and 3) temperature abuse. Even if fish is controlled at low temperature, once the levels of bacteria have increased and started to produce histamine, residual enzyme activity will still occur at refrigerated temperatures (although bacterial growth ceases) (Ross and Sanderson, 2000). Histamine can form during processing and storage (Pons-Sanchez-Cascado et al, 2005; Veciana-Nogues et al, 1996). From the study of Erderm (2004), histamine levels in anchovies freshly caught and immediately iced and further stored at refrigerated conditions could increase from 5.83 mg/100g (day 1) to 33.39 mg/100g (day 5) without any change in the storage condition.

Thirdly, for the concern on botulinum toxin, Clostridium botulinum of both non-proteolytic and proteolytic types, cannot survive the environment of high salt concentration (<10-12%). Therefore, they will not be able to survive in fish sauce where the salt concentration could be as high as 20%. Botulinum toxin if ever formed, would be degraded by proteolytic enzymes during fermentation. Since there is some proteolytic activity in the fish fermentation process, it is therefore most likely that the toxin may be inactivated (FAO, 1992). The fermentation process for good quality fish sauce normally takes at least 12 up to 18 months. It is unlikely that the toxin, if ever formed, could remain
in the rigorous condition of high salt fermentation. For your information, there has not been any incident of people becoming ill by consuming fish sauce in the history.

In conclusion, there are several factors affecting the histamine formation in fish sauce production. Temperature abuse is not the only factor contributing to high histamine level in the product but also other intrinsic factors in the fish itself and from the environment. Botulinum toxin should not be of a high concern as elaborated above. Setting up the histamine limit at 200 ppm is, therefore, rather unrealistic and not practical for commercial fish sauce production.

References


With this, Thailand has revised the Draft Proposed Standard considering comments received from the 33rd CAC as attached.
ANNEX

PROPOSED DRAFT STANDARD FOR FISH SAUCE
(At Step 6 of the Procedure)

1. SCOPE
This standard applies to fish sauce produced by means of fermentation by mixing fish and salt and may include other ingredients added to assist the fermentation process. The product is intended for direct consumption as a seasoning, or condiment or ingredient for food. This standard does not apply to fish sauce produced by acid hydrolysis.

2. DESCRIPTION
2.1 PRODUCT DEFINITION
Fish sauce is a translucent, not turbid liquid product with a salty taste and fish flavour obtained from fermentation of a mixture of fish and salt.

2.2 PROCESS DEFINITION
The product is prepared by mixing fish with salt and is put fermenting in covered containers or tanks. Generally, the fermentation process takes not less than 6 months.

Succeeding extractions may follow by adding brine to extract the remaining protein fish flavor and odour until the liquid is obtained. The product shall meet there requirements of section 3.3. Other ingredients may be added to assist the fermentation process.

2.3 PRESENTATION
Any presentation of the product shall be permitted provided that it meets all requirements of this standard; and is adequately described on the label to avoid confusing or misleading the consumer.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS
3.1. Raw material
3.1.1 Fish
Fish sauce shall be prepared from sound and wholesome fish in a condition fit to be sold fresh for human consumption.

[“Certain fish from some geographical areas have been found to accumulate biotoxins. It is up to the competent authority in the producing country to determine whether this risk exists in any geographical areas under their control and if so, put in the necessary mechanisms to ensure that fish parts used comply with the any applicable Codex requirements”]

3.1.2 Salt
Salt used shall be of food grade quality.

3.1.3 Brine
Brine is a solution made from salt and potable water.

3.2 Other ingredients
All other ingredients used shall be of food grade quality and conform to all applicable Codex standards.
3.3 Quality criteria
3.3.1 Organoleptic criteria shall be acceptable in terms of appearance, odour and taste as follows:

**Appearance**
Fish sauce must be translucent, not turbid and free from sediments except salt crystals.

**Odour and taste**
Fish sauce shall have odour and taste characteristic of the product.

3.3.2 Foreign matter
This product shall be free from foreign matter.

3.4 Chemical properties
- Total nitrogen content: not less than 10g/l;
- Amino acid nitrogen content: not less than 40% of total nitrogen content;
- pH: The pH shall be between 5.0 - 6.5;
- Salt: not less than 200g/l, calculated as NaCl

3.5 Final product
The product shall meet the requirements of this standard when lots examined in accordance with Section 11 comply with the provisions set out in Section 10. The products shall be examined by the methods given in Section 9. The packaging for the final product shall be free from any integrity defects, such as cracks, leakage, or loose pieces of the packaging units.

4. Food Additives
The use of food additives shall comply with the Codex General Standard for Food Additives (CODEXSTAN 192-2007). Acidity regulators, Antioxidants, Flavour enhancers, Sweeteners, Colours, Emulsifiers and Stabilizers, and Preservatives used in accordance with Table 1 and 2 of the Codex General Standard for Food Additives in food category 12.6 (Sauce and like products) and 12.6.4 Clear sauces (e.g., fish sauce) or listed in Table 3 of the General Standard for Food Additives are acceptable for use in foods conforming to this standard.

5. Contaminants
5.1 The products covered by this Standard shall comply with the Maximum Levels of the Codex General Standard for Contaminants and Toxins in Foods and Feed (CODEX/STAN 193-1995).

5.2 Raw material fish for fish sauce shall not contain marine biotoxins (e.g., Ciguatoxin, Tetrodotoxin and PSP) in amounts which could present a risk to human health.

5.2 Product made using aquaculture fish shall comply with the maximum residue limits for pesticides and/or veterinary drugs established by the CAC.

6. Hygiene and Handling

6.1 The final product shall be free from any foreign material that poses a threat to human health.
6.2 It is recommended that the products covered by provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice-General Principle of Food Hygiene (CAC/RCP 1-1969), Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.
6.3 The products should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

6.4 The product shall not contain more than 40 mg histamine /100g of fish sauce in any sample unit tested.

6.5 The product shall not contain any other substance in amounts which may present a hazard to health in accordance with standards established by the Codex Alimentarius Commission.”

7. WEIGHTS AND MEASURES

7.1 Fill of Containers

7.1.1 Minimum Fill Containers should be filled as full as commercially practicable.

7.1.2 Classification of “Defectives”
A container that fails to meet the requirement for minimum fill of section 7.1.1 should be considered as a “defective”.

7.1.3 Lot acceptance
A lot shall be considered as meeting the requirement of section 7.1.1 when the number of “defectives” as defined in Section 7.1.2, does not exceed the acceptance number (c) of the appropriate sampling plan with an AQL 6.5. In addition, the average net weight or net volume shall be greater than or equal to the declared net weight or net volume.”

8. LABELLING
In addition to the provisions of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985) the following specific provisions apply:

8.1 Name of the product
The name of the product shall be “fish sauce” or other names, in accordance with the law and custom of the country in which the product is sold, and in a manner not to mislead the consumer. The name of the product may be preceded or followed by the common or usual name of the fish. If during fermentation process, fish is mixed with salt or brine only, the fish sauce may be declared on the label as “natural fermentation” or “naturally fermented”.

8.2 Labelling of non-retail containers
Information on the above provisions shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer, as well as storage instructions shall appear on the container. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark provided that such a mark is clearly identified with the accompanying document.

9. SAMPLING, EXAMINATION AND ANALYSIS

9.1 Sampling of lots for examination of the final product
Sampling of lots for examination of the final product shall be in accordance with the Codex General Guidelines on Sampling (CAC/GL 50-2004). A sample unit is the individually packed product (bottle) or a 1l portion from bulk containers.

9.2 Sensory and Physical Examination
Sensory and Physical Examination Samples taken for sensory and physical examination shall be assessed by persons trained in such examination: in accordance with the Guidelines for the Sensory Evaluation of Fish and Shellfish in Laboratories (CAC/GL 31-1999) as follows:
• Complete external packaging unit examination for the presence of any integrity defects, particularly cracks or leakage or loose pieces of the packaging units.
• Examination of the product for translucence and foreign matter
• Evaluation of odour and taste

9.3 Test methods for chemical properties
9.3.1 Determination of total nitrogen: AOAC 940.25
9.3.2 Determination of pH: The pH shall be measured in a sample of fish sauce diluted with water to 1:10 using a pH meter. The dilution of fish sauce is necessary because of the high ionic strength in the undiluted sauce.
9.3.3 Determination of amino acid nitrogen by determining formaldehyde nitrogen (AOAC 2.066) and subtracting by ammoniacal nitrogen (AOAC 2.065)
9.3.5 Determination of Histamine: AOAC 977.13

10. Definition of Defectives
The sample unit shall be considered as defective when it exhibits any of the properties defined below.

10.1 Foreign Matter
The presence in the sample unit of any matter which has not been derived from salt and fish, does not pose a threat to human health and is readily recognized without magnification or is present at a level determined by any method including magnification, that indicates noncompliance with good manufacturing and sanitation practices.

10.2 Appearance
The presence of any sediments (except NaCl crystals) and/or cloudiness

10.3 Odour
A sample unit affected by distinct objectionable odour, e.g. rotten, putrid, rancid, gamey, pungent etc.

10.4 Taste
A sample unit affected by distinct objectionable taste, e.g. bitter, sour, metallic, taint, etc.

A lot shall be considered as meeting the requirements of this standard when:

(i) the total number of defective sample units as classified according to Section 10 does not exceed the acceptance number (c) of the appropriate sampling plan in Section 9; and
(ii) the food additives, contaminants, hygiene and labelling requirements of Sections 4, 5, 6, 8, are met”.
