codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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PROPOSED DRAFT AMENDMENT TO THE GUIDELINES FOR THE PRODUCTION, PROCESSING, LABELLING AND MARKETING OF ORGANICALLY PRODUCED FOODS:
PROPOSED DRAFT REVISED ANNEX 2 - TABLE 1
(NATURAL SODIUM NITRATE)
(ALINORM 04/27/22, APPENDIX VIII & CL 2004/22-FL)

GOVERNMENT COMMENTS AT STEP 3

COMMENTS FROM:

EUROPEAN COMMUNITY
NORWAY
SWITZERLAND
UNITED STATES
INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE MOVEMENTS (IFOAM)

PROPOSED DRAFT AMENDMENT TO THE GUIDELINES FOR THE PRODUCTION, PROCESSING, LABELLING AND MARKETING OF ORGANICALLY PRODUCED FOODS:
PROPOSED DRAFT REVISED ANNEX 2 – TABLE I
(NATURAL SODIUM NITRATE)
(ALINORM 04/22, APPENDIX VIII & CL 2004/22-FL)

GOVERNMENT COMMENTS AT STEP 3

EUROPEAN COMMUNITY (EC):

The European Community has the following comments:

- As to the proposed inclusion of **Natural Sodium Nitrate** (**Chilean nitrate)** in table 1, as returned to step 3, the European Community reiterates it is opposed to its inclusion. It considers this substance not to be consistent with the principles of organic agriculture and not essential for its intended use. Because of its high content of mineral nitrogen directly ready for uptake by the plant, it has not been allowed in organic farming in most regions of the world and its inclusion has not been supported by most members.

- Therefore the European Community proposes to close the discussion on this substance by concluding it will not be included in Annex II.

NORWAY:

Norway has the following comments to the Codex, concerning Annex 2, Table 1 of the *Guidelines for the production, processing, labelling and marketing of organically produced foods*, as presented in ALINORM 04/27/22, Appendix VIII;

According to organic principles, livestock manure, cultivation methods and fertilizers/conditioners of low solubility should mainly be used for fertilizing the soil. Sodium (Chilean) nitrate from natural deposits has high contents of mineral nitrogen and the nitrate is easily absorbed by the plant. This is not according to the organic principles, and Chilean nitrate should thus not be allowed in organic production.

Synthesized sodium nitrate is regarded as an easily absorbable fertilizer, and is not allowed to use in organic farming. It is hard to differentiate between synthesized sodium nitrate and Chilean nitrate, and it is therefore difficult to understand why Chilean nitrate should be allowed to use in organic farming.

As stated above, Chilean nitrate is easily absorbed by the plant. Easily absorbable nitrate may cause excessive levels of nitrate in vegetables. A high level of nitrate is unwanted in vegetables due to the conversion of nitrate to nitrite and nitrosamines during consumption. This aspect also emphasize why Chilean nitrate should not be used in organic production.

We would also like to mention that nitrate can easily be leached into ground water, which may have a negative impact on the environment. Chilean nitrate also has a high content of sodium, which can have negative consequences for the environment.

Therefore Norway proposes that Chilean nitrate should not be included in Annex II.

SWITZERLAND:

Switzerland welcomes the opportunity to submit the following comments on the Proposed Draft Standard and Guidelines at Step 3 of the Procedure (Proposed Draft Amendment to the Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods: Proposed Draft Revised Annex 2 – Permitted Substances:

Use of sodium nitrate

Switzerland is opposed to the inclusion of sodium nitrate in annex II.

Paragraph 5.1 of Section 5 of Codex Alimentarius Guidelines for organically produced foods requires, that any new substances must meet the listed general criteria. Sodium nitrate does not fulfill these criteria in following points:

- Not consistent with principles of organic production (foreword, paragraph 7): Sodium nitrate is a non-renewable resource and its use is not adapted to locally organized agricultural systems.
- Not necessary/essential for its intended use. Easily soluble nitrogen fertilisers are not needed to grow crops organically. Switzerland's national regulation as well as the EU regulation therefore prohibit its use.
- Availability of alternatives: There are renewable resources available in combination with good organic agricultural practises (crop rotation, use of legumes and other nitrogen fixing plants).
- Not essential for obtaining or maintaining the fertility of the soil or to fulfil specific nutrition requirements of crops (…) which cannot be satisfied by the practises included in Annex 1 or other products included in Table 2 of Annex 2. Easily soluble nitrogen does not have a positive effect on soil fertility.

The use of this fertiliser contradicts the principles of organic farming. Moreover, fertilisation with nitrates does not meet consumer expectations and there is an important risk that the positive image of organic products will be damaged if this substance may be used.

We are therefore requesting that this substance is deleted from the first table of appendix II of the Codex guidelines.

UNITED STATES:

The United States supports the inclusion of natural sodium nitrate in Table 1: Substances For Use In Soil Fertilizing And Conditioning, Codex *Proposed Draft Amendment to the Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Food: Proposed Draft Revised Annex 2- Permitted Substances.* Based on our experience with the substance, we find it to be useful in maintaining soil fertility levels in cooler climates where the use of other substances could contribute to contamination of crops, soil, or water by pathogenic organisms. Further, we are not aware of any consumer surveys showing consumer rejection of organic agricultural products produced using natural sodium nitrate.

We commend the professional and comprehensive data offered in support of inclusion of natural sodium nitrate in Table 1. Since the formation of the Codex Working Group on the Production, Processing, Labeling and Marketing of Organically Produced Foods, we are not aware of any soil fertilizing substance whose properties have been more fully examined.

INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE MOVEMENTS (IFOAM):

Natural Chilean Sodium Nitrate

At the last meeting of the Codex Committee of Food Labelling in Montreal, Canada, 10 – 14 May 2004 there had been no consensus in the Organic Working Group on the inclusion in Table 1 of Natural Sodium Nitrate (NSN) proposed by Chile, and the Organic Working Group had an extensive discussion on this question (see Alinorm 04 /27/22). Several delegations and the Observers from IFOAM and IACFO expressed their objections to the inclusion of this substance in the list, stating that it is not in conformity with the principles of organic production. Several delegations therefore proposed to return Natural Sodium Nitrate to Step 3 and the Committee agreed with this proposal, noting that this was possible in application of the Procedure.

IFOAM had made an evaluation of this substance against the Codex Criteria and have circulated a detailed evaluation in a table form recommending that this substance is not taken up in Annex 2. The Delegation of Chile recalled that it had provided substantial justification for the inclusion of NSN in document CX/FL 04/5-Add.1 and distributed a booklet of a private fertiliser company about Natural Chilean Nitrate in Organic Farming by Opdebeeck H. et al. (2004). IFOAM has made a critical scientific review of this booklet and a reply of the Chilean delegation to their justification (see Annex 1 in this document).

Basically the conclusions made by IFOAM in their earlier evaluation remain (see also IFOAM commentary May 2004, CX/FL 04/5)

Summary of the IFOAM evaluation Chilean Sodium Nitrate (May 2004)

Criteria for review	**Score**
Section 5.1 *General Principles* Consistent with the principles of organic production	--
Substance is necessary / essential for its intended use*	-
Manufacture, use and disposal does not result in, or contribute to, harmful effects on the environment	-
lowest negative impact on human or animal health and quality of life	-
approved alternatives not available*	-
Section 5.1(a) Used for fertilization and soil conditioning: essential for obtaining or maintaining fertility of the soil or fulfil specific nutrition requirement of crops, soil conditioning and rotation purposes witch cannot be satisfied by the practices included Annex 1, or other products included in Table 2 of Annex 2.	--
Ingredient is of plant, animal, microbial or mineral origin; may undergo the following processes: Physical (Mechanical, thermal), enzymatic or microbial (composting, fermentation); only when the above processes have been exhausted, chemical processes may be considered and only for the extraction of carriers and binders.	+
Their use does not have a harmful impact on the balance of the soil ecosystem or on the soil physical characteristics, or water and air quality	-
Use may be restricted to specific conditions, specific regions or specific commodities	0

-- Very negative, - negative 0 not considered + positive ++ very positive

Natural Chilean sodium nitrate is a naturally produced but easily soluble nitrogen fertiliser. The use of this fertiliser contradicts some of principles of organic farming such as the fertilisation concept and the system approach. Fertilisation is essentially seen as fertilising the soil and not fertilising directly the plants with highly soluble nitrogen mineral fertilisers. The main argument remains which is, that this fertiliser acts in the same way as a conventional nitrogen fertiliser substance (immediate uptake by the plant, non-renewable source for nitrogen where renewable sources are available).

Organic farming in many areas of the world also show that it is possible to grow crops organically without this easily soluble nitrogen fertiliser, based on good cultural practises (good rotations, use of legumes) and the complementary, careful and safe use of some plant-based or animal-based materials such as composted farmyard manure.

The IFOAM Basic Standards have prohibited the use of sodium nitrate for more than 10 years – after long and world-wide discussions - and , almost all national standards and private regional standards also prohibit the substance. IFOAM is therefore calling for this substance to be deleted from the first table of appendix 2 of the Codex guidelines for organically produced food and no more further considered.

Annex 1 to IFOAM Comments

Chilean Sodium Nitrate (CSN) and IFOAM commentary -
a reply to the comments of Chile and a critical scientific review of the booklet about Natural Chilean Nitrate in Organic Farming by Opdebeeck H. et al. in April 2004

Editors/reviewers: Brian Baker, Alfred Berner, Diane Bowen, Paul Mäder and Otto Schmid

IFOAM addresses in this commentary the reply made to the IFOAM evaluation of Chilean Sodium Nitrate (CSN) by the Government of Chile and the promoting firm in their booklet *"Natural Chilean Nitrate in Organic Farming* (Opdebeeck et al. 2004). The entire organic community knows that this particular material is one that has been much studied and long debated over several years. IFOAM reached the conclusion that the substance is not compatible with an organic farming system. IFOAM welcomes any new information that can help further the discourse.

IFOAM thanks the authors of the Chilean nitrate dossier for their observations and comments on the 1989 evaluation of the Technical committee of IFOAM. That evaluation was not the sole basis for the conclusion that sodium nitrate is prohibited in the IFOAM Basic Standards. IFOAM does acknowledge that some of the information was dated, and where the inaccuracies identified by the commentators can be verified they will stand corrected. It is certainly true that at that time only very few long-term comparison trials have just started and their results have not been published yet. However most of the more fundamental concerns, the organic farming community had at that time, still remain. The IFOAM commentary will focus solely on the points raised in the comments regarding the 2004 Evaluation.

Inaccurate comparisons
The commentators and promoters of CSN miss the main points in the evaluation of IFOAM. Many of the comments are based upon erroneous analogies, false or unsupported premises. In order to succinctly respond, these fallacies are not addressed point by point; readers familiar with the subject should recognize them. To explain this with a picture, in the evaluation of the Chilean Delegation of CSN often "apples are compared with oranges", for example when comparing nitrogen fertilisers with other mineral fertilisers such as sulphur or phosphorous fertilisers which act quite different.
A number of points may hold true for conventional farming, but are out of context with the organic farming system. Instead IFOAM's prefers to address the main technical points that they raise. IFOAM believes that these points are serious, and deserve attention. IFOAM identifies these points as (a) fertility, yield, and quality in organic and non-organic farming systems; (b) the context of organic farming as a whole systems approach; (c) misinterpretation of long-term trials; (d) environmental impacts; (e) inconsistency with other inputs used in organic production; and (f) general perception.

Fertility, yield, quality
It is argued that sodium nitrate is necessary because there is inadequate nitrogen supplied from organic sources to grow organic food in sufficient quantity and quality. Their argument is simply and eloquently refuted by the empirical presence of abundant, high quality organic food grown without CSN.

It is true that organic farming frequently results in lower yields, but organic farmer's objective is to optimise and not to maximise yields. Organic food produced by renewable organic fertilisers from biological sources can be produced with reasonable yields and with good quality (Stolze et al., 2000; Mäder et al., Nature 428, 796-798). Soil fertility is enhanced in organic farming as shown by various long-term experiments (e.g. Reganold et al., 2001, Nature 410, 926-930).

Nevertheless IFOAM acknowledges that also organic farmers need to achieve good yields. To use a very quick acting nitrogen fertiliser like CSN would be the "conventional" solution with certainly some short term advantages. But their use has important disadvantages. The fact that no highly soluble nitrate fertiliser could be used on organic farms in most countries of the world has forced the farmers to optimise their organic farming systems. The reliance of organic farming on CSN would be two steps backwards in this approach, neglecting the need of good rotations with soil building crops and the integration of animal and plant production in farming systems.
Furthermore the relatively important potential use of CSN may cause in many cases over-consumption by the plants with quality deficits, resulting in free amino acids and consequently a higher incidence of pests (aphids) and many diseases such as mildew.

Whole systems approach
Central to organic farming is the cycling of nutrients. The dossier from Chile misrepresents both organic systems and the results of research conducted in such systems. Many of the examples that they use are taken from conventional farming systems.

Research shows that mineral nitrogen fertilisation causes - via increased biomass residues - higher organic matter in the soil as compared to a system without fertilisation. This also leads to higher soil biological activity. In the short or medium term, soil organic matter breaks down more rapidly in the presence of mineral nitrate. But in comparison in long-term trials organic farming systems achieve however the highest organic matter content (Maeder et. al. 2002).

In the DOK trial, a long-term farming system comparison trial in Switzerland, mineral fertilised plots exhibited clearly the lowest biological activity and organic matter content, and organically manure plots (manure, compost) the highest (Maeder et al. 2002). It must also be mentioned that in this DOK-trial, which is referenced several times in the booklet of Opdebeeck et al. 2004, there was no sodium nitrate (artificial nor natural source) used in the conventional treatments because it is seldom used in conventional production because of the high, not desired sodium content (instead ammonium nitrate was used).

Animal manure is a product normally on the farm itself. Together with green manure, the use of legumes in the rotation (alfa-alfa, white-clover, red-clover), it can substantially contribute to the self-sufficiency of an organic farm. The huge losses from organic manure are mainly a result of the separation of arable and beef/milk production, resulting in huge areas in Europe and America with overstocking. In organic farming in most cases arable and live stock systems are linked.
As a direct available nitrogen source organic farmers can use liquid farmyard manure or other more quick acting animal manures like chicken manure and in addition by-products of the food-industry for top dressing. It is evident that the availability and suitability of a number of by-products is not always given, depending very much from country to country. However all over the world farmers have developed appropriate

fertilisation policies, careful soil management, organic matter recycling and rotation systems to overcome problems of availability, e.g.

1. Cultural tools such as harrowing, manure treatment, optimized time of application, incorporation of manure in the soil, the nitrogen efficiency of organic manure can make a farming system less dependent on external inputs.

2. By choosing the optimal age of green manure, the C/N ratio can be tuned, so a green manure acts as a nitrogen source or sink.

3. In cold soil, where mineralization is limited, faster nitrogen release organic fertilisers or carefully treated liquid animal manure can be used, which are better for soil quality improvement.

Long-term trials

The promoters of CNS misinterpret the results of long-term research in both organic and conventional systems. IFOAM agrees with the Chilean commentators that a survey of several long-term trials, which compare organic and conventional farming systems, shows that a mineral nitrogen fertilisation enhances soil organic matter as well. However, research shows however that a combined fertilisation with mineral and organic nitrogen fertilisers and in particular organic fertilisation alone increases soil organic matter even more. Results of the long-run implications of these systems have to be scientifically further explored to reach any valid conclusions.

Opdebeeck et al. 2004 specifically raise and misrepresent the DOK trial in Switzerland as reported by some of the authors of the publication mentioned. The DOK data presented in the Chilean comment are not up to-date over the whole 21year experimental period. The use of soluble nitrogen from farmyard manure was 3 to 4 times lower in the organic farming systems as opposed to the conventional systems, while yield decrease was only 20% (Mäder et al, 2002), showing a high nutrient-efficiency. The 73% lower addition by soluble nitrogen to the organic wheat field plots led to only 14% lower wheat yields (calculated over an 18 years period). However, the nutritional value, i.e. the protein content and the baking quality were hardly affected by the systems (Mäder et al, in preparation).

On average of the three crop rotation periods in the DOK trial, the conventional systems exhibited a 6% higher protein content, whilst soluble nitrogen input varied by 73%. The correlation between the soluble nitrogen, added to the wheat plots, and the grain protein content was weak and only significant in the third crop rotation period). This clearly demonstrates that by appropriate variety choice, good quality can be achieved with very low levels of soluble nitrogen input from organic sources (18 kg N/ha/year).

Environmental impacts

The commentators from Chile raise other inputs that they consider to be similar to sodium nitrate in their character or environmental impact. However, these can be used as arguments to support their prohibition and removal from organic farming systems. The promoters of CSN try to show that the environmental impact of CSN is compared with other mines less severe. Even if this might be the case, it is a fact that the overall negative impact of the mining of a non-renewable resource is negative, where in most areas of the world renewable organic nitrogen sources are available.

Furthermore the risk of misuse of Chilean Sodium nitrate is undoubting higher as compared to organically bound nitrogen sources such as animal manure or legume-based fertilisers.

Inconsistencies

Although there might be some inconsistencies in the assessment of different mineral fertilisers, the way these mineral fertilisers acts are quite different. CSN has a much higher potential to be leached out and to pollute surface and ground water than other mineral fertilisers used in organic farming, and none of the organic fertilisers have such an immediate uptake by the plants like Chilean Sodium nitrate, which from a conventional view point might be seen as an advantage but from an organic farming perspective is in contrast to the principle of Organic farming to feed the soil in order to feed the plant.

Even if the use of Chilean Sodium nitrate would be strongly limited per kg nitrogen per ha, this would be difficult to inspect.

Food quality and safety

Several comparative studies show that for most of the quality parameters organic food production achieves a reasonable and for some quality parameters even to a higher degree These trials show that this is mainly due to the predominant use of slow release fertilizers (e.g. compost, farmyard manure) e.g. lower nitrate content in leaf and root vegetables (Alföldi et al. 2002, Velimirov, 2003, AFFSA 2003). It was also shown quite clearly that with the use of organic fertilisers, the special treatment of manure and the system approach the food safety risks are not higher with organic farming, e.g. with regard to microbial risks, mycotoxins. In some cases due to the system approach Organic Farming can reduce certain food safety risks significantly (afssa 2004). Adapted varieties can guarantee a sufficient protein content even at low nitrogen fertilisation levels.

General perception

We need simple and easy regulations, which can be communicated to the consumers, to non-organic farmers, the retailers and the research community. In the case of CSN it is obvious that this requirement is not fulfilled. It is difficult to explain to a non-organic farmer or to the consumers that Chilean Sodium Nitrate acts different than a conventional quick acting mineral nitrogen fertiliser. The reliance of organic farming on the use of Chilean Sodium Nitrate would harm the credibility of the organic food production.

Literature

(complementary literature with respect to the impact issue, see also IFOAM Evaluation table 2004)

AFSSA, 2003: Evaluation nutritionelle des aliments issus de l'agriculture biologique. 233 p.

Alföldi T., Bickel R., Weibel F. (Traduction Afssa/Uaste), 1998. Recherches comparées sur la qualité des produits issus de l'agriculture biologique et conventionnelle : réflexion et critique des travaux de recherche menés de 1993 à 1998. Forschungsinstitut für Biologischen Landbau, 31 p.

Lairon D., Spitz N., Termine E., Ribaud P., Lafont H., Hauton J.C., 1984b. Effect of organic and mineral nitrogen fertilization on yield and nutritive value of butterhead lettuce. Plant Foods Hum. Nutr., 34: 97-108.

Mäder, P., Fließbach, A., Dubois, D., Gunst, L., Fried, P. und Niggli, U., 2002 : Soil fertility and biodiversity in organic farming. Science 296: 1694-1697.

Mäder L., Pfiffner, Niggli U., Balzer U., Balzer F., Plochberger A., Velimirov, Boltzmann L., Besson J.M., 1993. Effect of three farming systems (bio-dynamic, bio-organic, conventional) on yield and

quality of beetroot (Beta vulgaris L. var. esculenta L.) in a seven year crop rotation. Acta Horticulturae, 339: 11-31.

Raupp, J. (ed) 1996. Quality of plant products grown with manure fertilization. Fertilization systems in organic farming (concerted action AIR3-CT4-1940) Proceedings of the 4th meeting in Juva, Finland, July 6-9. Publications of the Institute for Biodynamic Research, Vol. 9, Darmstadt.

Reganold J.P., Glover J.B., Andrews P.K., Hilman H.R., 2001. Sustainability of three apple production systems. Nature, 410: 926-930.

Soil Association (Heaton S.), 2001. Organic farming, food quality and human health. A review of the evidence. 87 p.

Stolze, M., Piorr, A., Häring, A. & Dabbert, S. The Environmental Impact of Organic Farming in Europe. Organic Farming in Europe, Economics and Policy; Volume 6. University of Hohenheim (Hago Druck & Medien, Karlsbad-Ittersbach, Germany, 2000).

Vogtmann H., Temperli A.T., Künsch U., Eichenberger M., Ott P., 1984. Accumulation of nitrates in leafy vegetables grown under contrasting agricultural systems. Biological Agriculture and Horticulture, 2: 51-68.

Woëse K., Lange D., Boess C., Bögl K.W., 1997. A comparison of organically and conventionally grown foods - Results of a review of the relevant literature. *J. Sci. Food Agric*., 74: 281-293.