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Introduction

Debio is the Norwegian inspection and certification body for organic production, processing, distribution and import in Norway. The term “organic” is protected in accordance to agriculture production, and goods / commodity / products can only be sold as organic when the producer is approved by Debio.

Debio have been delegated authority from The Norwegian Food Safety Authority “to run inspection with organic agriculture production, processing, distribution and import in Norway. The supervision is control and approving in accordance with the Norwegian regulations for organic production and is in accordance with EU Regulations.

The Norwegian regulations on organic aquaculture are currently under preparation; for the time being, Debio standards are part of Norwegian Civil Law. The standards are, however, in accordance with guidelines from IFOAM Basic Standards. IFOAM, the International Federation of Organic Agriculture Movements, is an international association of organisations and agencies that are working to further organic production.

The regulations on organic aquaculture have been developed in cooperation with the Swedish inspection and certification body, KRAV. In addition to a joint set of standards for Norway and Sweden, there is mutual recognition between Debio and KRAV – in other words, when production is certified as organic by one body, it is automatically certified by the other. Both Debio and KRAV are engaged internationally regarding import and export.

A general portion of the standards applies to all organic aquaculture, while specific portions deal with the aquaculture of various species. In this second edition, there are specific standards for salmonid fish (salmon, trout, rainbow trout and char), perches, zander and cod. The intention is to develop specific standards for other fish species and shellfish as well.

Please contact Debio for further information on control routines, including inspections, certification and labelling, or visit our homepage, www.debio.no.



Debio’s label, the “Ø”, is the consumer guarantee that they are purchasing a certified organic product, and that the control system encompasses every stage of production, from the earliest stages to the end product.

Definitions

<i>Additives</i>	Product or preparation added to feed to: Give a positive effect for/on the feeds characteristics, or have an effect for the product Meet the animals nutritional requirements and increases the feed conversion ratio by mainly affecting the gut- and stomach or the feed digestibility Achieve special nutritional benefits or temporary meet special requirements for the animal
<i>Anadrome salmonids</i>	Salmonid fish that migrate from the sea to freshwater in order to spawn, as well as the roe and offspring from such fish.
<i>Aquaculture animals</i>	Living aquatic animals that originate from, or will be transferred to, an aquaculture facility.
<i>Artificial products</i>	Products not occurring in nature
<i>By-product</i>	Cut-off from the fish industry, including raw materials from fish originally intended for consumers but downgraded due to lack of quality.
<i>Certificate and certification documents</i>	The certificate confirms that the producer abides by Debio controls and standards. The certification document lists the production and activities that are certified as organic, as well as which products can be marketed with the Debio label. Certification documents are renewed annually.
<i>Conversion period</i>	The conversion period is the time between the start of organic management and certification of the production.
<i>Debio labelling</i>	Product labelling that refers to Debio as the inspection and certification body. (See Debio`s “Standards for Labels and Label Use”.)
<i>Environmental harmable chemicals</i>	Chemicals with negative affects on the environment.
<i>Freshwater fish</i>	All fish that live, or can spend part of their life cycle, in freshwater.
<i>Genetic engineering</i>	Genetic engineering is a set of techniques from molecular biology (such as recombinant DNA) by which the genetic material of plants, animals, micro-organisms, cells and other biological units may be altered in ways or with results that could not be obtained by methods of natural reproduction or natural recombination.
<i>ICES</i>	International Council for the Exploration of the Sea
<i>Marine fish</i>	All fish that live or spend all their whole life cycle in seawater.
<i>Medication</i>	Medication mentioned under the Norwegian Law on Medicinal Products, § 2, or in other sections of Norwegian law, as a result of the EEA Agreement no. 132 of 4 December 1992 (the economic agreement between the EFTA and EU countries).
<i>Nature identical</i>	Expression used for products that are synthetic produced, but also occurs naturally.
<i>Organic</i>	Those parts of production (fish pens, feed storage areas, production equipment, products etc.), which are encompassed, by organic pro-

<i>production units</i>	duction or production in conversion, and which the same owner or company manages. (See <i>Production unit</i> .)
<i>Parallel production</i>	Conventional as well as organic production in the same production unit.
<i>Production description</i>	A description of the production facility, which serves as a basis for Debio annual inspection. This description is formulated when the site is first inspected, and it is updated whenever significant changes are made. The description comprises the conditions under which the production permit was granted, as well as any conditions or measures agreed to between Debio and the producer to ensure a proper follow-up of Debio standards.
<i>Production unit</i>	All production – organic/in conversion and conventional – which is managed by a single owner/company. (See <i>Organic production unit</i> .)
<i>Synthetic product</i>	Product produced by chemical methods If the product also occurs in nature, its called natural identical, otherwise, artificial.
<i>Triploid organisms</i>	Organisms that have three sets of chromosomes as a result of the influence of temperature and pressure during the initial phase of the first cell division. Normally, organisms have double sets of chromosomes.
<i>Withdrawal period</i>	The required length of time an aquatic animal must be withdrawn after receiving medical treatment, until it can be classified as organic.

Formulating the standards

Each chapter has the following structure:

General principles	<i>Description of general conditions</i>
Recommendation	<i>Practical advice</i>
Standards	<i>Minimum requirements</i>

1. **Motivating Ideas and Principal Aims**

Within organic aquaculture it is an aim that the natural resources are managed in such a way that negative effects on the environment are avoided.

The production must as far as possible be based on local and renewable resources.

Motivating Ideas

The organic production is based on a general view including the organic, economic and social sides of the production, both in a local and a global view. Organic aquaculture must be operated in such a way that the marine environment will be a positive part of the nature.

Principal Aims

The most important aims of organic aquaculture production are to:

Produce high quality foods in quantities which are sufficient and fairly distributed.

Consider the wider social and ecological impact of the organic production and processing system.

Develop a stable aquatic ecosystems.

Manage the natural resources in such a way that harmful/negative effects on the environment are avoided.

Secure a genetic diversity and richness of species.

Make an environment that favours the organisms natural behaviour and demand.

Secure a healthy and balanced use of the water resources and water living organisms.

Secure as far as possible recirculation of nutrients (harvest leftovers, manure).

As far as possible establish the system on local and renewable resources, support good communication between the organic aquaculture industry and the general society.

Secure local stock against negative affects from the farming/aquaculture activities.

2.

How to Take Part in the Debio Control

General principles

To market aquaculture products as organic with Debio-labelling, the operation must be in adherence to the Debio control scheme, and the approval must be verified.

Debio is following the law of professional secrecy – Law of administration, 10th of February 1967.

Fee for taking part in the control scheme and the terms of payment will be published at the beginning of the year. The Debio board sets the fee.

To run a suitable control, the actual company must have a contact person facing Debio. The operation manager can himself be such a contact person, or delegate this responsibility.

There will be performed At least one announced inspection each year for all units connected to the Debio control. In addition unannounced inspections can be performed.

The handling of the approvment will be done based on information from the inspector. The inspector procures the information about the running operation, but do not himself participate during handling of the approval.

As a documentation for the running approval there will be produced a certificate with a certificate document. The certificate confirms adherence to the control body, and the certificate document shows the production methods that are approved (conversion or organic), and the products that can be marketed with Debio-labelling. The certificate document must be renewed yearly.

It is assumed that public laws in accordance with the operation are fulfilled.

The standards for organic aquaculture are an addition to official regulations concerning the production.

We also refer to the standards for processing, import and trade and Debio's Standards for labels and the use of labels.

Recommendation

Advices and supervisions according organic operations shall be sought with organisations / instances involved in this as their own field of expertise. Debio will only be able to give advice in the use of standards and control system.

Production, processing and trading organic goods assume their own routines, and the company/firm shall therefore be well aware of the actual agreements.

In many cases it will be natural that it's the same person that are responsible for the company/firm quality assurance system that also are responsible facing Debio. All employees that are handling goods covered by the control scheme shall be trained in the actual standards. The general principles about organic primary production and processing shall be included in the training.

Standards

2.1. Adherence to Debio

2.1.1.

Every firm/company that wants to use Debio-labelling in relation to farming, harvesting (slaughtering), processing, import or trading, or wants Debio-labelling on such products approved as organic by another foreign control-body, shall have a separate adherence to Debio.

2.1.2.

The company pays a fee to enter into the Debio-control scheme, and addition yearly fees. Fees will be published by the beginning of each year.

2.1.3.

The company is part of the control scheme when Debio have received the application.

2.1.4.

The company is obligated to fulfil the demands that at any time are given in Debio standards.

2.2. Contact Person

2.2.1.

The company shall have one person that is the contact person facing Debio. This person is responsible for following up and reporting according to the standards. Debio must be informed who is the company contact person.

2.3. Inspection

2.3.1.

The Debio inspector shall announce about actual inspection days at least two weeks ahead. If the announced time is not convenient for the company contact person or the deputy with delegated responsibility, this shall immediately be announced to Debio. The company must confirm

the inspection time at least one week ahead. If the company contact person / deputy is not present during agreed inspection, new inspection can be run with an additional fee, or the company can be shut out from the control system this year.

2.3.2.

At the very first inspection there shall be a production description stating how the standards are fulfilled for the production unit. The production description shall be worked out according to appendix 3 in EU Regulation 2092/91, and shall be approved by Debio.

The production description shall be updated as required, at the least every five years.

2.3.3.

During the yearly inspection the company shall have all agreed documentations given in the running description available.

2.3.4.

In addition to yearly-announced inspection, Debio also can run un-announced inspections.

2.3.5.

Companies not having a regular activity according Debio-approval, shall within a prior agreed time-limit inform Debio about planned time for start of the activity and duration.

2.3.6.

Tests can be run/performed to control that the products are produced according to running agreements. The costs in connection with sampling/analysing shall be covered by the company.

2.3.7

If the company contact person / deputy not are present during the agreed time (point of time), or if during the inspection vital information or documentation not are given access to, or if it in other ways are put up hindrance that makes it difficult to run usual inspection routines, the inspection visit can be interrupted and the fundament of the approval can be dropped.

2.3.8.

The site manager is with his signature legal responsible that information about the activities/operations are given as good as possible.

2.3.9.

If the producer breaks terms given by Debio or by the authorities, or if other regulations are not complied with – illegal use of labelling, not giving information on important changes in the production – then the producer can be economically responsible and may be shut out from the control scheme for a period of time.

2.3.10.

The company covers all expenses in accordance with the inspection based on fees announced at the beginning of the year.

2.4. Approval

2.4.1.

As a confirmation of approved production Debio will produce a certificate with certificate documentation. The site manager is responsible for the keeping and the legitimate use of the certificate.

2.4.2.

The site manager is bound to inform Debio if important changes occur about the running operation after an inspection. This also covers insufficient following up of possible duty given by public authorities. Deviation in accordance to the conditions for the approval shall immediately be reported to Debio.

2.4.3.

The approval covers the running methods. Debio-approval/- labelling of products are no guarantee against reminders caused by conditions in air, water or rainfall. Debio-approval/- labelling is no guarantee of fulfilling of quality demands covered by ordinary grading standards.

2.4.4.

The approval is valid until the time of next handling of approval. If approval is wanted for other type of production before the next inspection, this shall be announced to Debio at least 12 weeks before the actual time of marketing.

2.4.5.

Overview covering companies having received the label approval, and what the label approval covers, will be published.

2.4.6.

Overview (lists) covering companies that are no longer carrying the label approval, caused by withdrawal or not approved, will be published.

2.4.7.

The approval is redrawn if the requirements in the standards of Debio are not fulfilled or the company loses public approval.

Dependent on the type of contraventions, parts or the whole running operations can be rejected. If the producer fails to execute terms given by Debio or public authorities, if other laws are broken, or the producer abuse the label or neglect to report major changes in the running operation, Debio can put sanction in operation covering prohibition against marketing organic products and the use of the Debio label for a specific time, until five years.

2.4.8.

Resolutions made by Debio can be appealed to a specific appeal committee established by the board of Debio.

3. Scope

Organic aquaculture covers farming of different species living in fresh water, brackish water and salt water, including transportation and slaughtering/harvesting of these species. The species in aquaculture can be carnivore, herbivore or omnivore (eating meat, plants or both) covering all stages.

These can be farmed in all sorts of land based and floating/submersible enclosures in the sea or fresh water, or in a pond/lake with natural limitation and where the area are available for inspection.

Stationary organisms, for example seaweed and shellfish, can be certificated as organic when the other running conditions are full filled. Organisms that can move freely in open water, and/or not can be inspected after usual procedure for organic production, including wild living fishes, cannot be included by the idea “certified organic aquaculture”.

These regulations have specific rules for the individual species salmonids, perches and cod.

General Standards for All Types of Organic Aquaculture Production

4. Production Setup

General principles

The overall objective for the production shall be consideration for the environment and the well-being and good health of the organisms. The production shall be managed so that the organisms live to the greatest possible extent in an environment that is arranged to secure their fundamental physiological and behavioural needs.

The production shall be managed in such a way that the environment in surrounding water and land area is preserved through:

Minimal impact on the local biological processes, which covers micro-organisms, plants and animals.

Preventing escape.

Use of marine feed which comes from a sustainable managed stock and which is not normally used as human food, or by-products from species used as human food.

Managing the production so that infections, parasites and drug residues do not affect wild (animals) in the environment.

Not using synthetic/chemical fertilizers and impregnating (painting) agents that strain the environment.

Providing for diversity in the production (polyculture) where this is possible (for example production of common sea mussels in connection with fish breeding).

The production can consist of both organic and conventional production provided that these operating units are kept well separated (parallel production).

Records must be kept for the whole production unit, the organic and the conventional production.

The fallowing period between generation is at minimum 4 months.

Recommendation

It is recommended that the whole management of the unit is converted to organic production. To gain experience with this type of production, however, it may be appropriate to convert the production step by step. After some production cycles the whole production on the organic unit should be transferred to organic production.

Consideration for the surrounding environment is crucial for positioning

and management of the organic unit. This consideration shall include the Norwegian national salmon fjords, and with respect to risk of infections special care must be taken at outlets of salmon running rivers in Sweden. In accordance with the objectives for organic aquaculture it is important that the production is located at an appropriate distance from polluting sources and conventional units.

Feed wastage or faeces, which are collected, shall if possible be used as fertilizer in organic agriculture or in other appropriate ways.

Standards

4.1. Conversion to Organic Production

4.1.1.

At the very first inspection there shall be a production description stating how the standards are fulfilled for the production unit. The production description shall be worked out according to appendix 3 in EU Regulation 2092/91, and shall be approved by Debio.

The production description shall be updated as required, at the least every five years.

4.1.2

The organic production unit shall be clearly defined and demarcated so that organic feed, input factors etc. cannot be mixed with conventional. It shall be possible to inspect the unit with respect to the documentation requirements laid down in the standards.

4.1.3.

An operating record shall always be able to be presented as a documented systematic overview of the production activity. The record shall be available during inspection.

4.2. Parallel Production

4.2.1.

The situation with parallel production must NOT be permanent – within 3 years the whole unit must be organic.

The separation from conventional production must be clear, traceable and have physical barriers.

If the whole production unit is not converted at the same time, the following applies:

The units shall not affect each other through feed wastage, medication, use of cleaning agents, and so on.

In sea and lakes, the distance between open organic and conventional installations shall be at least 250 metres.

In flowing freshwater the organic unit and/or the unit in conversion shall lie at least 10 metres upstream of the conventional unit.

For land-based installations, there shall be physical barriers between organic and conventional units.

Areas for storing feed and input factors between the different production methods shall be kept well separated.

Feed and input factors for organic production shall be clearly marked.

4.2.2

Converted units cannot switch between organic and conventional management without this first having been agreed with Debio. A return to conventional production without Debio approval means that Debio can refuse a new certification as organic for up to five years.

4.2.3.

Both production methods, organic and conventional, shall be documented separately through record keeping, accounting and so on including the whole operation

Debio shall have access to relevant documentation for the conventional management as well.

4.2. Environment / Water Quality

4.3.1.

The water shall have such a low degree of pollution and such a content of oxygen that the cultivation organisms show no signs to changed parameters according physiology or behaviour. The unit must not be positioned in the vicinity of, or downstream of an important source of pollution that in any sense can be against the rules.

4.3.2.

The unit (net pen) shall be positioned in an area with a good water movement, and/or so that no significant sediment build-up occurs underneath the unit. The unit must have a yearly environment inspection (MOM B) based on NS 9410 if available and the activities must be adjusted in a way that long term activities at the location can be run without environmental affects worth mentioning.

4.3.3.

The environment shall be loaded to the minimum possible extent with feed wastage and faeces that can cause over-fertilization or other disturbances. Depending on technical possibilities, Debio can demand collection in and around the unit.

In fresh and brackish water with content of nutrients higher than background levels, the rules are closed net pens (tarpaulins) or similar, adequate systems for the collection of faeces and spilled feed starts from 2009.

4.3.4.

Material, equipment, paints, etc., used in the production shall be selected based on the environmental caution principle.

4.3.5.

Growth on production equipment shall be removed in the first instance using mechanical or biological methods.

Antifouling with poisonous chemicals is prohibited.

4.3.6.

Installations for cultivating fish or other aquatic animals shall have a container or other device for satisfactory storage of dead aquatic animals. The capacity shall be dimensioned for the installation's production and cleaning routines.

4.3.7.

The fallowing between different generations shall be at least 4 months.

4.3.8.

Operators shall not deplete nor excessively exploit water resources, and shall seek to preserve water quality. They shall where possible recycle rainwater and monitor water extraction.

4.3.9.

The use of fertilizers and pesticides is prohibited.

4.3.10.

Harvest of aquatic plants shall not disrupt the ecosystem or degrade the collection area or the surrounding aquatic and terrestrial environment.

5. Conversion Period

General principles

Conversion to organic production is a process to develop an environmentally sustainable production system with special consideration for the well-being and health of the cultivated organisms, and where the environment continues to keep its sustainability and renew ability. The time between the start of organic management (handling, caring and feeding) and certification of the organic production is called the conversion period. The conversion period of the production unit shall be at least one life cycle of the organism or one year, whichever is shorter.

The aim is that the cultivation complies with the standards for organic production throughout the organism's life cycle. If certified organic material (fry, for example) is not available, importation of organisms from conventional production with a subsequent conversion period is permitted. The organisms may be classified as organic when at least two thirds of their life span is spent in the organic system counted from hatching, see also 6.1.

During the conversion period, the standards for organic management shall be applied, and it is therefore necessary that inspection be performed during this period as well.

Recommendation

A conversion period should not be started until all conditions for stable organic production are fulfilled.

Standards

5.1.

The conversion period of the production unit shall be at least one life cycle of the organism or one year, whichever is shorter.

During the conversion period, the requirements for organic production laid down in these standards shall be fully complied with.

5.2.

Organic approval includes that the production must be inspected during the conversion period.

6. Breeds and Breeding

General principles

The breeding work shall focus on health and environmental sustainability and good growth with the minimum possible use of input factors. The production shall be managed so that injury to individuals is avoided. The production must be controlled in such a way that malformations are avoided (by using updated knowledge).

Recommendation

Breeds that are adjusted to local conditions should preferably be used. Breeding should build on a large number of breeding pairs to prevent inbreeding, genetic damage and loss of genetic variation. Fry/fingerlings should if possible be bought locally, to reduce transportation time as much as possible.

Standards

- 6.1.**
If breeding material is brought into the unit, this shall be certified organic when it is available with desired characteristics.
If organic animals are not available, brought-in conventional animals shall spend not less than two thirds of their life span in the organic system.
When organic stock is not available, conventional sources may be used according to time-limits agreed upon in the description of the production unit.
- 6.2.**
If organic certified fry is available, this must be used.
- 6.3.**
If certified organic breeding material with desired characteristics cannot be obtained, a full conversion period is required.
- 6.4.**
Triploid and genetically modified organisms are not permitted.
- 6.5.**
A change of sex through artificial influence is not permitted.

6.6.

During hatching and during the fry period environmental factors must be controlled to avoid malformations.

6.7.

Fry must be graded before transferring to ongrowing to reduce the possibilities of deformed fry in the ongrowing pens.

7. Feed and Feeding

General principles

The feed in organic aquaculture shall be of good quality with a nutritional composition to fulfil the species requirement. The feed shall consist of certified organic products and/or raw materials originating from wild aquatic stocks. For resource reasons, aquatic raw materials from stocks that are not used for human consumption, and from by-products, shall be used. A basic principle is that marine raw materials originate in fishing activity operated in a sustainable way, take in consideration the function of the total marine ecosystem and preferably are certified as sustainable harvest. To secure over fishing of such stocks, we recommend that the quotas set by ICES are to be followed.

Additives such as vitamins, minerals, antioxidants and colouring agents shall have a natural origin or shall be as close to their natural form as possible. Synthetic/unnatural additives are not permitted.

Feeding shall be performed in a way that allows natural feed intake with minimal wastage. The feed type and feeding shall not have a negative effect on the biological diversity in the area.

In all connections taking care of the environment and good feed conversion ratio shall be a superior goal during choosing feed and feeding.

Recommendation

In all connections, consideration to the environment and efficient feed utilisation shall be a basic principle when choosing feed and feeding. The aquatic raw materials should come from certified sustainable fisheries, to the extent that such are available.

We want to encourage feed materials based on cut offs or other materials of biological origin that are not suitable, or to a little extent are used as direct feed for humans. Simultaneously the feed shall cover all the nutritional needs for the organisms, and in no way contain concentrations of environmental poison that can be harmful for the fish or as food or feed.

7.1. Raw Materials

7.1.1.

Feed for aquaculture organisms shall basically consist of 100 percent organic certified feed and/or feed originating in wild aquatic stocks, which is approved for use in organic production.

If such feed is not available, up to 5 percent of the feed (dry weight) can be of conventional origin.

Ongrowing feed must contain at least 30% organic vegetable ingredients. The dry matter level in the feed must be at least 45%.

7.1.2.

If a certified organic feed ingredient is available, but not in a justifiable way with regard to use of resources or not with satisfactory quality, a dispensation can be given for use of an equivalent conventional ingredient for a time-limited period.

7.1.3.

Raw materials from wild fish can be used in organic production under the following conditions:

Wild fish shall come from sustainable stocks and shall be certified as such by a certification body accepted by Debio.

Or:

Where raw materials from sustainable fisheries are not available or only constitutes a proportion of the feed, at least 50 percent of the aquatic protein in the remaining proportion shall come from by-products. The rest shall then consist of aquatic raw materials from species that normally are not used for human consumption and come from sustainable stocks

If raw materials from wild caught fish are used, this shall come from sustainable stocks that are within biological secure limits according to ICES. This means that the raw material shall come from fish stocks where the catch/harvest not exceeds the recommendations set by ICES for the actual year or/and are in accordance with the FAO Code of Conduct or certified by MSC.

7.1.4.

Ingredients that are genetically engineered or produced using genetic engineering are not permitted.

7.1.5.

Materials from the same species as the feed is going to be used for are not allowed.

7.1.6.

The feed in organic aquaculture shall be of good quality with a nutritional composition to fulfil the species requirement.

7.2. Additives

7.2.1. Approved additives

7.2.1.1.

Natural colourings from: shrimpshells, algae, yeast and bacteriae.

7.2.1.2.

Natural antioxidants, vitamins, minerals, natural nucleotides (from walls of yeast), and binding agents of natural origin.

7.2.1.3.

When minerals and vitamins are found both in concentrated/synthetic form and natural form, additives in a natural form shall be used when this is reasonable. If this is not possible, synthetic vitamins and minerals can be used when pre-approval is given by Debio.

7.2.1.4.

Other additives according EU Regulation 2092/91, Appendix IV.

7.2.2. Additives that are prohibited

The following synthetic/unnatural additives are prohibited:

Growth regulating agents

Appetite stimulants

Antioxidants

Preservatives

Colouring agents

Amino acids

Hormones

The following are also prohibited:

Gelatine from cattle

Additives consisting of GMO (genetically modified organisms)

Additives produced using GMO

Products/ingredients where chemical solvents are used during the production

7.3. Record Keeping

7.3.1.

The production manager shall keep a monthly record of the feed type, feed producer, and quantity fed.

8. Health and Animal Welfare

General principles

Efforts should be made to attend to the organisms' health through preventive measures so that medication does not become necessary. If there are still signs of disease, suitable measures shall be adopted immediately. When breeding fish, prophylactic work shall be carried out, including effective vaccination against relevant infectious diseases, so that outbreaks of disease and use of drugs are avoided to the greatest possible extent. The production conditions shall always be such that the risk of infection and outbreak of disease is minimised.

In the event of disease, animal welfare and environmental care shall be crucial when choosing method of treatment.

In organic production the objective is to maintain a low aggression level and to prevent fish from injuring each other. It is documented that a low stock density can lead to increased aggression for certain species of fish. On the other hand, a high stock density can also cause discomfort. In these standards, the stock density weighs these considerations against each other, compare with Chapter 9.5.

The production unit should have a minimum deep of 15 m.

The production unit must continuously being kept under control/supervision in such a way that stress or diverging behaviour will be discovered. If this is the case, appropriate measures must be taken so that the organisms can resume to its normal behaviour.

Predators must be discouraged from damaging or stressing stock by the use of effective deterrents that are non-destructive both to target and non-target species.

To prevent spawning of cod in the nets, artificial light is allowed to prevent this. However selection of late spawning fish should eliminate this requirement in the future.

Recommendation

Production should focus on prophylactic health work and be adjusted to the needs of the organisms. There should be hygienic routines, and routine examinations should be carried out to detect latent diseases and production disturbances.

Biological combating of disease should be prioritised above use of chemicals where this is possible and effective, for example for delousing with the help of wrasse. Drugs with the minimum environmentally harmful effect and with the minimum risk to human and animal health should

be preferred. The risk of resistance to antibiotics in the environment should be given special consideration.

The organisms shall be handled as little and as carefully as possible.

The water quality should be such that the physiological demands for the species not are affected in a negative way.

Standards

8.1. Treatment / Medication

8.1.1.

Organisms that show signs of disease shall be given suitable treatment immediately.

8.1.2.

Synthetic chemical drugs shall be used when no other treatment method can be justified from the viewpoint of animal welfare or when this is required according to national law.

8.1.3.

Routine prophylactic treatment with synthetic chemical drugs is prohibited.

8.1.4.

Drugs and additives in feed and water that is added to artificially promote growth/production are not permitted.

8.1.5.

Drugs consisting of GMO, or which are produced using GMO are not permitted.

8.1.6.

Artificial light is allowed to prevent maturation and spawning in the net pens.

An artificial day length may not be longer than the year's longest natural day length for the location.

In open installations, light may only be supplied in the form of underwater light.

8.1.7.

When using drugs and disinfectants in the breeding installation, care shall be taken and active measures adopted to minimise pollution of the surrounding environment.

8.1.8.

Use of chemical allopathic veterinary drugs and antibiotics is prohibited for invertebrates

8.2. Withdrawal Period When Using Drugs

8.2.1.

The withdrawal period when using synthetic chemical drugs is twice the legal withdrawal period.

Synthetic chemical drugs that do not have a legal withdrawal period have a withdrawal period of two weeks in organic production.

8.2.2.

During treatment with drugs with a withdrawal period in one unit, the same withdrawal period applies for all surrounding organic production within 250 metres in sea and lakes, and within 10 metres when a treated unit lies downstream in flowing freshwater.

8.2.3.

With the exception of vaccinations, treatments for parasites and any compulsory eradication schemes established by Member States, where an animal or group of animals receive more than two or a maximum of three courses of treatments with chemically-synthesised allopathic veterinary medicinal products or antibiotics within one year (or more than one course of treatment if their productive lifecycle is less than one year), the livestock concerned, or produce derived from them, may not be sold as being products produced in accordance with this Standard, and the livestock must undergo the conversion periods laid down in Chapter 5, subject to the agreement of the inspection authority or body.

8.3. Record keeping

8.3.1.

A record shall be kept covering handling of diseases where drugs with withdrawal periods have been used.

The record shall contain:

Identification of the relevant disease/infection

Details about type and length of the treatment

The type of drugs used

Implemented withdrawal period

Specific Rules for the Production of Fish

9. Salmonids, Perches and Gadoids (Cod)

This section contains specific standards for salmonids, perches and gadoids. These standards are based on the General Standards for All Types of Organic Aquaculture Production.

The section covers the species Atlantic Salmon, Rainbow Trout, Brown Trout, Arctic Char, Perches, Zander and Cod (Atlantic Cod – *Gadus morhua*).

The standards for Conversion to Organic Production (4.1), Parallel Production (4.2), Conversion Period (5.1), and Feed and Feeding (7.1) apply in their entirety.

The following additional standards also apply for salmonids, perches and cod.

Standards

9.1. Measures Against Escape

9.1.1.

The production shall focus on preventing escape, regarding technical equipment and internal control. Current effort shall be a part of the operation description.

The plant/operation shall fulfil demands within NS 9415 or similar (shall use the strongest there is – the best available technology).

The best technology available is to be used.

9.1.2.

The production manager for breeding salmonids/gadoids shall have contingency plans for all production units as to how any potential escapes can be limited and how recapture can be made more efficient. This is valid for all production units in use. Any escape shall immediately be reported to Debio in addition to the actual authorities.

The contingency plan shall also cover governing principles to reduce the possibilities for escaping fish when moving breeding cages, net pen changing, stranger changing, and when handling fish during grading / loading / unloading, and during extreme weather conditions.

9.1.3.

Debio can impose special conditions on the production manager to prevent escapes and to identify escaped fish, for example, these conditions can be individual marking..

Visual inspection of the net pens should be done at least once a month, for example with divers or by the use of underwater camera. This activity must be documented.

If the cod farming operation is using a special strong net pen, visual inspections of the net pen should be done every three months.

9.1.4.

If a farmer is sentenced for irresponsible management of his farm regarding escapes of fish, it will entail that Debio approval will stop.

9.2. Environment and Water Quality (cf. Chapter 4)

9.2.1.

Daily measurements shall normally be performed and logged for the organic production unit, regarding:

Temperature

Salinity (in marine installations)

Oxygen content

Carbon dioxide (land-based installations)

In net pens all measures shall be performed in the centre at a depth of 3 metres (10 m for cod).

In land-based installations measurements shall be performed in the outlet water. Too high temperatures can create great stress for the fish. The water temperature in an organic plant/installation shall not for a longer period than one week (7 days) exceed:

19 C for farming arctic char

20 C for farming salmon and trout

20 C for farming cod

22 C for farming rainbow trout

28 C for farming perch and zander

The solution of oxygen in water is dependent of temperature and salinity. The oxygen level shall be kept optimal in relation to the fish welfare.

As a minimum the oxygen content in the water shall be at least 7 mg oxygen per litre, and the water through flow shall be so great that harmful effects of carbon dioxide (CO₂) and ammoniac (NH₃) are avoided.

When there is a risk to exceed these limits, the operation shall be equipped with suitable equipment, for example for pumping up colder water to net pens or ground water to land based operations, and adding oxygen.

9.3. Record Keeping

9.3.1.

The following information shall be recorded every month for every production unit:

Putting out and stock of salmonids and cod, number of individuals, species, origin, times when put out and average weight (live weight)

Volume per production unit

Number of kilograms of fish per cubic metre water volume

Removed quantity of dead/dying fish. Information about the quantity shall be specified as the number of individuals and total weight in kilograms.

Production result (harvesting weight). Information about the quantity shall be specified as the number of individuals and total weight in kilograms.

Use of cleaning agents and disinfectants, including agents given exemption for, chemical type, product name, quantity and period of use.

9.3.2.

Information about the following conditions shall be recorded every calendar month for the organic production unit:

The fish's health status. In the event of disease, the diagnosis shall be specified, as well as who has made the diagnosis (fish health control / veterinary surgeon), diagnostic investigations carried out (public/private laboratory), treatment implemented or treatment method, withdrawal periods.

Handling of dead fish: Method, quantity, time of delivery, and recipient.

Oxygen level/content, temperature, salinity (at sea plants), carbon dioxide (land-based operations), inspections of the net pen condition/situation, and the fish behaviour.

- Escaped fish

9.4. Breeds and Breeding (cf. Chapter 6)

9.4.1.

The biological material (such as roe, fingerlings and breeding fish) taken into the production unit shall come from breeding/operations with regular health control.

9.4.2.

Breeding salmonids and cod shall originate from domesticated fish.

Roe and fingerlings of perches can come from wild (caught) parents. Parent fish should be caught with gear causing as little damage and stress to the fish as possible, for example fyke nets/ traps. The use of gillnets is not allowed.

9.4.3.

The origin of the breeding fish shall be recorded.

9.5. Health and Animal Welfare (cf. Chapter 8)

9.5.1.

When adjusting the stock density, consideration must be given to:

The fish must have a low aggression level and low frequency of fin biting / damage.

That the fish can form shoals.

That the fish optima behaviour is maintained.

That the fish density do not cause behaviour indicating stress.

The oxygen content in the water (cf. 9.2.1, Environment and Water Quality).

- For cod the fish density must not exceed 15 kg/m³ and not exceed 10 kg/m³ on average during ongrowing.

9.5.2.

The production unit shall be registered in a health control programme.

9.5.3.

In the event of abnormal behaviour or mortality exceeding 0.5 per thousand daily, this shall be reported to the fish health control programme and to Debio.

Necessary action must be taken immediately to solve the problems and restore normal conditions.

Emergency slaughter shall be considered as an alternative to medication.

9.5.4.

Dumping of dead/dying fish or fish parts/residues is prohibited. Release of fish from the production unit is also prohibited.

Dead or diseased fish, waste that comes from the production and used packaging materials shall be considered to be infectious and shall be treated correctly so that it cannot cause a spread of infection. Packing materials should if possible be recycled.

This means that dead or dying fish should be picked from the production unit daily, if possible. Dying fish should be put to death immediately. Dead fish shall immediately be ground down and be conserved in acid or handled according to other approved treatment methods.

9.5.5.

In the event of occurrence of salmon lice (cod lice), natural methods shall be preferred, wrasse for example, if there not are heavy arguments against this. The reasons can be that the location has too strong currents or too exposed location, or that the production plants are in the county of Troms or Finnmark. Even if the use of cleaner fish not gives a total solution to the lice problems, the cleaner fish can do an important job by grazing surviving female lice after medical treatment, or keep control over lice during the time the fish are stored in waiting/harvesting pens. Attention shall be given to the wrasse's natural needs, for fed and by providing hiding places in the cage.

During bath treatment against salmon/cod lice the treatment should be done using closed tarpaulins for all production units at the location to reach an effective control with the treatment concentration, minimise the

use of chemicals, reduce outlet to nature, reach an effective treatment and to avoid the development of resistance against the actual medicine/medicament.

It there are needs for regional delousing, the organic plants/operations shall participate.

9.5.6.

Vaccination is permitted if it is established that there is or have been a disease in the area and that it cannot be controlled using prophylactic production methods. Organic certification is not affected by vaccination that is recommended by the fish health service or the veterinarian authorities.

Vaccination should be performed in such a way that brings as little harm and stress to the fish as possible.

Only GMO free vaccines must be used.

9.5.7.

In case of deviations in the fish physiology and/or behaviour are noted/recorded, suitable actions should immediately be taken to restore optimal conditions.

9.5.8.

The fish within one production unit should be graded according to size in such a way that the distribution in size does not cause poor fish welfare.

The grading should be performed with as little stress as possible for the fish.

9.6. Transportation

9.6.1.

Live fish can be transported for a maximum of 6 hours by truck. Without water exchange. Max density with transportation of fry is set to 10 kg/m³.

There can at most be 30 kg/ m³ in closed well boat transportation.

Well boat with constant water exchange can at most have a fish density of 50 kg/m³. As a minimum the oxygen content in the water shall be at least 7 mg oxygen per litre.

Debio can give a time-limited dispensation from this standard.

9.6.2.

There shall be a person responsible for the animals' well being during transportation. It shall immediately be reported to Debio if the transportation causes stress or physical injury to the fish.

9.6.3.

Transportation equipment and materials shall not cause poisoning.

9.6.4.

Synthetic stimuli or tranquillisers must not be administered in connection with transportation.

9.6.5.

Transport time, number of fish and any deviations from the standards during transportation shall be recorded.

9.7. Harvest

9.7.1.

All handling in connection with harvesting shall cause the least possible suffering and stress to the fish.

9.7.2.

Fish must be starved in connection with harvesting, at a minimum 3 days, but not more than 2 weeks (14 days) or 150 day degrees (water temperature x days).

9.7.3.

Capture methods for salmonids/cod can be a tight collection bag, vacuum pump, seine and fish trap. Fish caught using a hook or line cannot be certified as organic.

9.7.4.

Fish shall be unconscious before they are killed.

Fish shall be unconscious with a blow/stroke against the head using equipment accepted by the authorities.

All fish that are made unconscious shall be killed immediately.

Putting to death shall be done by bleeding.

Fish shall be totally unconscious before bleeding.

Debio / the control body can allow the use of natural occurring medicine to calm down the fish before slaughtering/harvesting.

It is allowed to use cold water (+ 1 °C) to calm down the fish before harvest.

9.7.5.

Fish shall not be prepared for slaughter in water with temperature higher than what is stated in 9.2.1.

9.7.6.

Slaughtering and subsequent handling of certified organic and conventional fish shall be clearly separated in time or space so that the fish cannot be mixed.

Specific Rules for the Production of Mussels

10.

Organic Mussel Farming

Introduction

Blue mussels (*Mytilus edulis*), hereinafter referred to as "mussels", have separate sexes and during spawning, eggs and sperm are released into the water where fertilisation takes place. The mussel larvae drift with the current. In mussel farming, the drifting mussel larvae are allowed to settle on collector ropes, ladders, nets or similar structures that are submerged in the sea. This type of mussel farming is called suspended (or hanging) culture. The mussels are not fed, but live by filtering algae and microorganisms from the water as it flows by.

This form of mussel farming thus does not lead to an over-exploitation of existing stocks.

Nutrients taken up by the mussels are removed from the sea upon harvesting. Growing mussels in areas with high nutrient concentrations would thus be a suitable way to mitigate environmental problems such as excessive algal growth, oxygen depletion and lifeless seabeds.

Mussel farming can therewith serve a double purpose: ensuring the production of a popular quality product while at the same time improving the marine environment.

As a filter feeder, mussels reflect their surrounding environment. Stringent restrictions regarding the concentrations of environmental pollutants in the mussel-growing area are thus necessary.

During certain times of the year, mussels can contain biotoxins produced by aquatic algae (algal toxins). Consuming such mussels could adversely affect the health of animals (including farmed fish) and humans. For this reason, the authorities require mussels to be tested for their contents of such toxins prior to consumption, using either chemical analysis or bioassays. For the time being, bioassays may also include the use of live animals (mouse bioassay).

Chemical testing methods are being continuously developed, and they will eventually replace bioassays after having been approved by the authorities. Bioassays will then only be used in research in order to detect any new toxins.

Definitions

<i>Grade A area</i>	Classification of water quality in the mussel growing area based on bacteria contamination, according to definitions in the Council Directive EEC 854 / 2004. Mussels harvested in grade A areas can be directly consumed, whereas mussels from grade B areas have to be depurated (kept or rinsed in suitably clean water) before being sold.
<i>Cultivation</i>	Mussels are filter feeders, living on algae and microorganisms suspended in the water. Optimal growth is achieved in areas with a high algal production, substantial availability of other microorganisms and a steady current. Mussels are sessile and depend on the food carried by the current. Mussels are therefore not fed in the traditional sense.
<i>Suspended culture</i>	Various types of floating structures support longlines, to which growing lines (also called droppers) are attached. The floating mussel larvae settle on these growing lines after spawning.
<i>Mussel harvest permits</i>	The Norwegian Food Safety Authority requires the documentation of water quality, algae occurrences and mussel algal toxin levels according to specified procedures before permitting the harvest of mussels for commercial marketing.
<i>Harvesting</i>	Stripping and removing the mussels from the growing lines.
<i>Conditioning</i>	Mussels grown in suspended culture have not been exposed to the tides, and are thus not used to opening and closing with the tidal rhythm. Prior to packing, mussels can be exposed to artificial tides to improve their ability to open and close their valves. This increases shelf life during distribution and marketing. Other producers use only chilling to achieve the same effect.
<i>Mussel larvae</i>	Tiny mussels that drift freely in the sea until they find a place where they can settle and start filtering seawater. Recently settled larvae are often called spat.
<i>Environmental monitoring</i>	Mapping and monitoring the seabed in the vicinity of aquacultural facilities. Please refer to NS 9410 for MOM (Modelling - Ongrowing fish farms – Monitoring), the guidelines issued by the National Pollution Control Authority (TA-1890/2005, 'Recipient Surveys in Fjords and Coastal Waters') or the Pollution Control Authority's marine classification system (SFT 1997).
<i>Buoys / floating structures</i>	Floats or tubes that support the longlines or nets for mussel cultivation.
<i>Predators</i>	In mussel farming, 'predators' is a collective term for all organisms that either live on mussels or also settle on the growing lines and compete for food and space. Common predators include eider ducks, starfish and crabs.
<i>Tending</i>	All physical measures taken to ensure the quality of the mussels.
<i>Spat collectors</i>	Ropes, ladders or nets used in suspended culture to collect spat and as a growing site for mussels.
<i>Re-tubing (or re-stocking)</i>	Placing spat onto ropes at optimal spacing, and encasing them in a cotton mesh stocking. The mesh stocking eventually dissolves in the

seawater.

Thinning

Harvesting the mussels when they still are small, sorting them by size and then re-tubing them (see above) to ensure optimal growing conditions.

Rules

10.1 Environment and water quality

10.1.1.1. Effect of environmental contaminants

Documentation in the form of hydrographical data shall be provided to show that the mussel growing facility is not affected by anti-fouling agents, other chemicals or medicines from nearby fish farms.

10.1.1.2. Water quality

The mussel growing unit shall be located in grade A areas in accordance with Council Directive EEC 854 / 2004.

10.1.2. Environmental impact of the mussel growing facility (water)

The mussel farm shall have as little adverse effect on the seabed as possible.

This implies a requirement to clean up/remove structures when reconstructing, moving or closing down mussel-growing facilities.

Mussels drop off from the growing lines naturally, either by being crowded out by other mussels growing on the lines or by wave-induced movements of the structure. Mussels falling to the seafloor become part of the marine food chain, serving as food for fish, sea urchins and other organisms.

The impact of mussel drop-off on the seabed varies, depending on the ocean depth and existing currents.

To monitor and document this impact, mussel farms must conduct environmental assessments before and during production, when biomass peaks. The assessments are to be described in the individual mussel farm's operation report.

Mussel farms shall normally not be placed in water that is shallower than 30 m. If this requirement cannot be met, the reasons for this shall be described in the operation report.

10.1.3. Sustainability

A mussel farm's site and size must be chosen so that nutrient access is sufficient to ensure good growth. Farm sites must have sufficient water flow and exchange.

This must be described and documented.

10.1.4. Site location

Mussel farm sites shall be chosen to ensure as little conflict as possible with the general public, including recreational interests. The inspection body can require the producer to submit a statement issued by the County Governor as documentation.

The evaluation of site location is also based on the possibility of already existing pollution in the area, and on the potential for achieving positive results regarding the parameters mentioned in sections 10.2 and 10.5.

10.2 Keeping records

Every mussel-farming unit shall record the following information bi-monthly. This information is to be provided in addition to other information required by the authorities:

- **Predation:** Estimates of the number of avian predators and the amount of mussel loss.
- **Water quality:** At each site, measurements of specific environmental parameters must be made in critical periods. Critical periods are when temperatures are highest between July and September.

These environmental data must be recorded:

- Water temperature
- Dissolved oxygen (recommended: > 70 % saturation)

Fish or mussel farms always have an impact on the environment. It is thus important that the facilities are designed and operated to maximise production efficiency and minimise the strain on the environment. Although mussels are not covered by the current animal welfare act, it is also important that mussel farms focus on ensuring good animal welfare in their operations.

The measurements enable focus on optimizing and improving operations in the long run.

10.3 Animal health and protection

Mussel farm operations shall aim to achieve stocking density and size composition that enable optimal conditions for the species (water flow and food access). This could require sorting, thinning and site-specific adjustments of such parameters as the area to biomass ratio.

Handling, see section 10.11.

10.4 Predator control

Mussel farms shall not be established in areas in which it is known that predation pressure is considerable. They shall not be established in eider duck nesting or moulting areas. In connection with the establishment/approval of mussel farms, a statement on these issues from the county office of the environment (*Fylkesmannens Miljøvernavdeling*) or equivalent body must be submitted.

A survey of predation pressure shall be made, and environment-friendly, species-specific measures implemented to prevent predation if mortality exceeds normal values. Relevant measures are to be specified in the operation report.

Measures/installations shall be used to scare away predators. Scaring measures shall be used irregularly and in a random sequence.

Starfish, crabs and fouling organisms can be removed mechanically, e.g., by rinsing with water or hand-picking. Removed predators and any excess mussels are to be returned to the marine food chain, preferably at between 5 to 20 metres depth.

If anti-predator nets are used, it must be documented that these do not harm diving birds.

10.5 Aesthetics

Mussel farming facilities shall fit into their surroundings, and not be obtrusive.

Existing facilities with structures that do not comply with this rule must have replaced this equipment by 01 January 2011.

Equipment storage areas shall be kept tidy and as non-obtrusive on the surroundings as possible.

10.6 Harvesting

At harvest, all on-grown mussels shall be collected. Small mussels that are rejected can be placed into mesh stockings and returned to the sea for further on-growing.

If such retubing is done as bottom culture, this must be limited to nearby areas to prevent the spread of genetic material to new areas. When using bottom culture, the operation report shall document that harvesting does not have a harmful effect on the seabed and other marine species. The documentation must consist of a study and a report performed by an

independent third party on harvesting activities in the area. The study must also assess possible effects of environmental toxins.

Harvesting and other work carried out at the facilities must be done in a way that minimises damage to the mussels and the surrounding environment.

During harvest, the mussels shall immediately be protected against sunlight with a tarp or similar cover, and kept cool with water spray (see also section 10.8.).

The harvesting process shall not damage more than 4 % of the mussels.

10.7 Conditioning

10.7.1. Conditioning prior to shipment in big bags

The mussels must be kept at a constant, low temperature. If this is done by sprinkling them with seawater, the mussels must be placed on a drainable surface so that they are not left standing under water.

10.7.2. Conditioning at the dispatch centre prior to packing

Live mussels shall be conditioned before being packed and shipped.

10.8 Packing

10.8.1 Packing of live mussels in open-weave bags or boxes

Mussels shall be packed as close to shipment time as possible, and no later than two working days after conditioning. Live mussels shall be handled and stored at a temperature of between -1 °C and +4 °C (cf. Regulations relating to the quality of fish and fish products, FOR 1996-06-14 nr 667).

10.9 Processing

After being harvested, mussels are still living organisms, and shall thus be treated as carefully as possible.

Damage to mussels, from the start of processing until the product has been packaged, shall not exceed 4 %.

Residues from sorting and processing shall be utilised – when possible as fertiliser in organic agriculture, as feed or as a resource in some other reasonable way.

If such utilisation is not possible, processing residues shall be disposed/composted in accordance with current regulations and as described in the operation report.

10.10 Shipment and storage

During shipment and storage, live mussels shall be handled as carefully as possible.

The workflow must be designed to avoid rough handling (physical shocks, falls, etc.) during harvesting, shipment, storage and other procedures, since this causes unnecessary stress reactions in the mussels.

During further shipment and storage, the mussels shall be kept moist and in an unbroken refrigeration chain at a temperature of between -1 °C and +4 °C. (Cf., Regulations relating to the quality of fish and fish products - FOR 1996-06-14 nr 667).

10.11 Technical equipment

Mussel farms shall utilise the most appropriate technology and the best cultivation equipment that can be used at each respective site.

When deciding on what equipment to use, minimising shipment distance and the use of eco-labelled products shall be emphasised.

Floating structures shall be recyclable. For ropes, metals and other materials, products with the least environmental impact shall be used.

Stainless steel or anodised aluminium shall preferably be used in equipment.

Equipment for disposal shall be delivered to a certified waste collection centre.

Wastes and used equipment shall be recycled.

Oil used in mussel farm operations shall to the greatest extent possible be of a type that minimises the risk of food contamination and environmental pollution.

Diesel-powered vessels used in connection with mussel-farming operations shall use diesel with the lowest sulphur contents available on the market.

Outboard motors shall be 4-stroke engines. Two-stroke engines have to be replaced with 4-stroke engines by the end of 2011.

10.12 Internal control systems

A plan for the control and maintenance of the enterprise's technical

equipment shall be prepared, based on the use of inputs that are as environment-friendly as possible. This is to be described in the operation report, including such items as the use of oils and lubricants, fuels and antifouling paints.

The enterprise shall have a contingency plan for situations that could lead to mass death.

10.13 Cleaning / disinfection

Vessels / processing

Cleaning and disinfection agents used to clean vessels, premises and equipment applied in harvesting and processing mussels or mussel by-products shall be documented and selected on the basis of environmental considerations.

The treatment of seawater for the depuration of mussels can only be done using mechanical filters and UV treatment. Freshwater shall meet drinking water standards. The use of chlorides is not permitted.

Wastewater must be treated according to government regulations, and documentation shall be provided that the method applied is certified.

10.14 Quality control

Quality control of mussels with regard to hygiene and food safety shall be carried out according to government regulations.

Biological assays shall be replaced by chemical tests as soon as these have been approved by the authorities.

More information on processing, packing, labelling and retailing of products from organic aquaculture is available from www.debio.no.

