Animal Welfare in the Norwegian Fish Farming Industry

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1 Introduction

The fish farming industry constitutes one of the most valuable export businesses in Norway, alongside oil and gas. In 2015, the industry exported seafood for approximately €7.5 billion, almost double the amount in 2006. Nearly 70% was from the fish farming industry, whereas the rest was from traditional fisheries with trawlers and other boats harvesting fish at sea.[1] In 2017, the export value from the fish farming industry alone was about €6.7 billion. Most facilities farm salmon and trout, but some also farm codfish and Atlantic halibut, among other species.

The Norwegian Animal Welfare Act of 19 June 2009 applies to fish, which is explicitly stated in Section 2. Accordingly, the industry must abide by the regulations concerning transportation, living conditions, breeding, harvesting, etc., in the Animal Welfare Act. However, the Act is broadly worded and not specifically linked to fish. How the regulations are implemented at fish farms is therefore quite different from how they are implemented in stables or barns. How we speak about fish also differs from how we speak about dogs, wolves, or other mammals. We refer to fish as biomass and quantify them in tons or cubic meters, thus distancing ourselves from fish as living creatures.[2] The laws which regulate the industry keep that distance: it is stated in the Aquaculture Act of 17 June 2005, Section 2 that aquaculture is defined as the production of animals and plants living in water.

In this article, I will discuss how the regulatory measures in the Norwegian Animal Welfare Act are implemented in the fish farming industry.

2 The Aquaculture Act

Most industrial fish farms are established at sea or in fiords along the coastline. As they form a part of marine life, environmental concerns are of utmost importance. It is stated in the Aquaculture Act, Section 1 that a main purpose of the law is to contribute to a sustainable development in the coastline area. Production-related diseases and deformities among farmed fish are widespread. The problem with the salmon louse (*Lepeophtheirus salmonis*) has caused an increase in the death rate among fish over the years. It is therefore a problem that the Norwegian authorities have shown less interest in enacting requirements governing the welfare of farmed fish, compared with their interest for other livestock and animal husbandry.[3] The main relevant regulations are the Regulation on the Operation of Aquaculture Installations of 17 June 2008, which *inter alia* has requirements concerning the living conditions of farmed fish, and the Regulation on Slaughterhouses and Processing Facilities for Aquaculture

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1 E24.no, "Sjømateksporten passerte 91 milliarder i fjor" (4 January 2017) www.e24.no/naeringsliv/i/OnpmEO/sjoemateksporten-passerte-91-milliarder-i-fjor.

2 Torill Moseng, "Overskriftene får oss til å akseptere det uakseptable" (14 February 2020) www.dn.no/innlegg/dyrevelferd/oppdrett/havbruk/overskriftene-far-oss-til-a-akseptere-det-uakseptable/2-1-753679.

3 Andreas Føllesdal (ed.), *Dyreetikk* (Fagbokforlaget 2000) 53.

Animals of 30 October 2006, which specifies requirements on the slaughtering of farmed fish.

The Aquaculture Act is based on the principle that one cannot establish a fish farm without an aquacultural authorisation from the competent governmental ministry, see Section 4. This also means being registered in the Aquacultural Registry, see Section 18. The procedure involves many governmental bodies, at both a local and a national level, since many different public interests are affected. At the local level, it is necessary to receive authorisation to build the buildings and infrastructure necessary to farm fish. The local authorities must determine if and how the fish farm can co-exist with other facilities or environmental interests. At the national level, authorities must evaluate whether the establishment of the new facility will endanger the ecosystem in the area, and how it will influence traditional fisheries and the existence of naturally occurring species, such as wild salmon or rainbow trout. Authorisation for establishment of a fish farm is valid in a specified geographical area. The authorisation may set forth various requirements regarding for instance the maximum production quantity, the maximum length of the authorisation, and environmental requirements regarding water quality, oxygen levels, etc.

There are two different kinds of authorisations in the Aquaculture Act:[4] a fish farming authorisation and an establishment authorisation. In the cases of salmon and trout, a clear distinction is made between the two authorisations. For other species, both authorisations are encompassed in a single decision. Section 7 of the Aquaculture Act authorises the Ministry of Fisheries to issue regulations on authorisation of fish farming entities that produce salmon and trout. The main purpose is to facilitate a system to control the production capacity. All authorisations have an upper biomass limit (MTB = "*maksimalt tillatt biomasse*" [maximum biomass permitted]). The biomass is defined as the total weight of the fish in the production plant at any time. Since 2013, the main reason for controlling the capacity has been an environmental concern: the production must not exceed a critical load on nature.[5]

As described above, establishment authorisations are decisions whereby production entities with fish farming authorisations are permitted to establish themselves at specific locations. Under the Production Area Regulation of 16 January 2017 No. 61, there are 13 different production areas along the Norwegian coast. They are numbered starting from the south: area 1 is between the Swedish border and Jæren along the southwest coastline, area 6 is Nordmøre and Sør-Trøndelag in the middle of Norway, and area 13 is in the eastern part of Finnmark, all the way to the Russian border. Whether or not a fish farm may be established in a specific area depends on the total capacity already existing in that area. Every second year, the Ministry of Fisheries evaluates the impact of the fish farming industry on nature in each production area. The Regulation introduces a "traffic light" system. If the impact on nature in an area exceeds its critical load, this is deemed unacceptable and that area is marked as red. If the impact is acceptable, the area is marked as green. Moderate impact is marked in yellow. In a red area, establishment of new farms is not permitted, and Section 9 of the Regulation allows the Ministry to decide that the existing farms in the

4 Halfdan Mellbye, *Rettslig regulering av norsk akvakultur* (Universitetsforlaget 2018) 67.

5 Ibid. 71.

area must reduce their production. In green areas, new farms may be established, and existing farms may increase production in accordance with Section 11. In yellow areas, the production capacity may not be altered, as set out in Section 10.

Indirectly, the welfare of the fish is of relevance when classifying an area as red, yellow or green. Several environmental indicators must be evaluated. One of these is the occurrence and number of salmon louse on wild salmon in the area, which is explicitly mentioned in the Regulation. No other indicators are mentioned, and it is problematic if this leads to a lopsided evaluation, as other environmental criteria are also of relevance. The evaluation should take into account, i.a., the welfare of other species in the area, especially wild fish other than wild salmon, and water quality.

3 The Welfare Situation

The Fish Health Report from 2019, prepared by the Norwegian Veterinary Institute, estimated that approximately 8 million salmon died in May 2019 in Northern Norway due to an unprecedented increase in algae in that area.[6] The total mortality rate of salmon in 2019 was 52.8 million. In 2018, the number was 46.2 million. A total of 59.3 million farmed salmon were lost in 2019, including through escape. Hence, the mortality rate was 89.1% of the total loss.

The salmon louse is still the predominant health issue. The number of incidents increased in 2019. Unfortunately, an increasing number of salmon lice has grown resistant to ordinary medication. Therefore, the industry has developed other means of delousing salmon, but injuries caused by mechanical delousing have become a new welfare issue.

Other growing health issues are cardiomyopathy syndrome (cracked heart), pancreas disease (viral illness), infectious salmon anaemia, and incidents with bacterial infections which cause visible wounds on the fish (winter wounds etc.). The usage of antibiotics is still quite low, and the occurrence of antibiotics resistance is still low.

In 2019, the mortality rate among cleansing fish in the fish farming industry was registered for the first time. Cleansing fish (*rognkjeks* (lumpfish, *Cyclopterus lumpus*) and *leppefisk* (wrasses, *Labridae*)) are used to keep the occurrence of salmon louse to a minimum, as they eat the lice and other parasites. It is estimated that the mortality rate is about 42% among cleansing fish, but this number is known to be inaccurate, based on the number of cleansing fish found alive when facilities are closed down.

The usage of slaughtering net pens in the fish farming industry has led to many welfare issues in the last few years. They are used to lower costs from the slaughtering process, by keeping a certain amount of fish close to the harvesting plant, ready to be slaughtered. Such net pens are used by 84% of the harvesting

[6] Veterinærinstituttet [the Norwegian Veterinary Institute], "Fiskehelserapporten 2019: Små tegn til bedre helse for oppdrettsfisken" (Rapport 5a/2020) https://www.vetinst.no/rapporter-og-publikasjoner/rapporter/2020/fiskehelserapporten-2019.

plants, according to a report from the Norwegian Institute of Marine Research.[7] The fish are kept in these net pens for 2–3 days without being fed, and in many net pens the level of oxygen is below acceptable levels due to the high concentration of fish. The welfare issues relating to these net pens will be discussed further in passage 5.2.

4 Animal Welfare Act

According to the Norwegian Animal Welfare Act, Section 3, animals have intrinsic value independent from the value they may have for human beings. However, the impact of this content is questionable from an animal law point of view. It is unclear whether it goes beyond the mere symbolic meaning of the words and if it has any legal consequences with a fundamental meaning for animals and their lives.[8]

More decisive for the welfare of animals is Section 3, second paragraph, which states that animals shall be treated well and not be subject to unnecessary burdens and strain. These provisions govern all circumstances that affect animals.[9] Hence, farmed fish must not be subject to unnecessary burdens, whether directly or indirectly caused by actions or neglect on the part of human beings. Overfeeding or starving fish, overusing or not using antibiotics or having too many or too few fish in a net pen are examples of actions that may cause strain to farmed fish and that therefore are prohibited. The usage of slaughtering net pens has raised some concern, as the conditions in these net pens are often poorer than the conditions in the ordinary net pens where the fish are bred and raised. The duty of care in the Animal Welfare Act is described in passage 4.2 below. Passages 4.3 through 4.6 provide a brief overview of the Norwegian animal welfare legislation.

The distinction between necessary and unnecessary burdens is not defined in the Act itself. The slaughtering of farmed fish of course causes strain on the fish, but is necessary for the very essence of farming fish: providing food on the table. On the other hand, the slaughtering methods, and the treatment of fish before they are slaughtered, must be as painless as possible. Hence, fish – like other animals being slaughtered – must be stunned before being put to death, according to Section 12 of the Animal Welfare Act. This is described in passage 5, below.

Section 12 has roughly the same contents as the previous Sections 9 and 10 in the Animal Protection Act of 1974. The previous regulations were more detailed, but did not describe the different stages of the slaughtering process. For example, the previous regulations prohibited putting animals to death in sight of other animals.[10] This is still prohibited, but not explicitly mentioned in the Act. The requirement of necessary competence among the staff at slaughterhouses,

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7 Havforskningsinstituttet [the Norwegian Institute of Marine Research], *Fiskevelferd ved bruk av slaktemerd for oppdrettsfisk* (2006).

8 Vegard Bø Bahus, *Dyrevelferdsrett* (Fagbokforlaget 2019) 37.

9 Cecilie M. Mejdell and Inger Helen Stenevik, *Dyrevelferdsloven kommentarutgave* (Universitetsforlaget 2011) 27.

10 Ibid. 135.

and among other people slaughtering animals, is regulated in Section 6 of the Animal Welfare Act.

4.1 Relevant Regulations

For slaughterhouses, there are detailed requirements found in the Regulation on Slaughtering of Livestock of 13 January 2013 no. 60. This regulation is based on the Council Regulation (EC) No 1099/2009 of 24 September 2009 from the European Union on the protection of animals at the time of killing. However, these regulations explicitly do not apply to fish, only to other animals living on land or in the sea. It therefore applies to sea lions and seals, but not to salmon or codfish.

The Regulation on Slaughtering of Livestock includes detailed regulations on how to stun mammals using bolt guns, electricity, or gas. According to Section 12, pigs can be stunned only through the use of gas and with the animals in groups of at least two, with enough light they can see each other. Bleeding of animals must be performed immediately after they are stunned.

The corresponding provisions on the welfare of farmed fish when being slaughtered are found in the Regulation on Harvesting Plants regarding Aquaculture Animals of 30 October 2006 no. 1250. According to Section 10, fish must be put to death as soon as possible after arriving at the harvesting plant. It is also stated that it is prohibited to slaughter fish so fast that it affects the well-being of the fish. The fish must be stunned in an appropriate manner; the usage of carbon dioxide (CO_2) for stunning is prohibited under Section 14. Though these regulations were enacted in 2008, the restrictions in the usage of CO_2 were not implemented until 2013.

Comparing these two regulations, it can be seen that the one concerning fish is more general, with no specific requirements concerning the welfare of fish. It states that the welfare of the fish shall be considered at all stages of the slaughtering process and that all methods, technical installations, and equipment used must be appropriate. On the other hand, the regulation concerning other animals includes specific requirements in several instances, for example on the usage of electrical rods when driving the animals forward. Such rods may only be used if they are set to emitting a few brief electric shocks at a time, with minimum intervals of 10 seconds.

This illustrates the dilemma concerning welfare regulations on farmed fish. Economic concerns in the industry often outweigh the need to improve the welfare situation. In other agricultural branches, such as in the production of milk or eggs, it would – in my opinion – have been impossible to postpone implementation of a provision corresponding to the restriction on usage of CO_2 for over 5 years.

The regulations regarding the welfare of fish at harvesting plants are, for the most part, given in the form of functional requirements. These requirements focus on the goals which are to be achieved, such as that the equipment shall always function in a proper manner. However, the requirements do not lay out how to achieve the goals.

The challenges of functional requirements are mostly related to the understanding of what good welfare is, what proper functionality is, etc. This is not an objective assessment, but highly subjective, and may change with time,

knowledge and general attitudes in society. This means that both compliance with and supervision of functional regulations can be challenging.

The Norwegian Food Safety Authority has issued guidelines in order to clarify the contents of the functional requirements regarding the slaughtering of fish.[11] The relevant guidelines are described below in passage 5.2, which describes the process of slaughtering farmed fish.

4.2 Duty of Care

The duty under Section 3 of the Animal Welfare Act to treat animals well and protect them from the risk of unnecessary burdens and strain, is a legal standard that applies to all dealings with animals – whether or not they are kept in captivity. It makes sense to deal with the duty of care together with the rules on animal husbandry, as it has its greatest importance as a guide for their implementation. Nevertheless, the legal standard will also have an impact on the application of rules on the medical treatment of animals, the killing of animals and the duty of assistance.[12]

The legal standard refers to norms on the good treatment of animals, outside the law itself. What 'good treatment' of animals is considered to be will primarily depend on the veterinary, aetiological, and ethical perceptions of good animal welfare. In addition, purely practical and economic conditions will have an impact, as will the common perceptions in society.

Other provisions of the Animal Welfare Act, such as Sections 23 and 24 concerning the environment of animals and supervision and care of animals, elaborate on the duty of care. Various regulatory provisions further clarify these provisions. The legal standard is primarily important as an interpretative factor in the application of other provisions of the Act and in the regulations, but also has independent meaning when no particular rules have been established.

The Norwegian Supreme Court has applied the duty of care in some cases and clarified that the object of assessment is not the negative treatment one is willing to accept, but the good and proper treatment of animals. In a judgment, the consideration of economy was weighed against the consideration of proper feeding of animals.[13] It was clarified that the requirement on proper feeding is absolute. Failing finances do not exempt an animal owner from the duty to safeguard the health of their animals and to provide them with adequate feed. This has been followed up in more recent judgments which have also elaborated that failing finances cannot exempt an owner from the duty to call a veterinarian if necessary.

The provision includes an interest assessment of when a burden or strain is unnecessary. It will be based on ethical and professional assessments (within ethology and veterinary medicine), but practical and financial considerations are also relevant. An undue burden or strain is at hand if the usefulness of a measure is low in relation to the suffering inflicted on the animal through said measure.

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[11] Mattilsynet [the Norwegian Food Safety Authority], *Veiledning om krav til god fiskevelferd ved slakteri for akvakulturdyr* (2014).

[12] Bahus 58.

[13] Rt. 1994 p. 1274.

This legal standard has been further developed in regard to animal experiments. If animals are inflicted suffering in medical animal experiments, the usefulness must be great for this to be accepted.

The condition that animals should be treated well concerns the situation when the animals are alive. Another matter is whether an animal is considered to have the right to live. There is currently no requirement that killing must have an accepted purpose or usefulness. It is still common and permitted to kill a cat because the cat owner is going on an overseas holiday or has grown tired of the cat.

The duty to protect animals from the risk of burdens and strain also encompasses preventing and avoiding hazards. The legislation is based on a "precautionary" principle and means that measures should be taken before any danger arises. One should exercise caution and, for example, move sheep down from a mountain if there is a risk of a wolf attack and not wait until after the wolves have started to kill sheep.[14]

4.3 Living Environment

It is central to good animal husbandry that the habitat provided to the animal is good. Section 23 of the Animal Welfare Act sets out general requirements on the living environment. It expresses that animals should be kept in an environment that ensures good welfare. When assessing good welfare, the needs of both the species and the individual are relevant.[15] Examples of what is encompassed by good animal welfare are given in the first paragraph of the provision: the possibility for stimulating activities, movement, rest and other natural behaviour. This list is not exhaustive. Lastly, it states that the living environment should "promote good health and contribute to safety and well-being".

Section 8 of the Animal Welfare Act has provisions on modes of operation, methods, equipment, and technical solutions for animal husbandry. These apply mainly to production animals and overlap with Section 23. It is important to keep the concept of operating form separate from the concept of living environment. The requirements on living environments in Section 23 relate to the specific individual components of for example a barn or aquarium, such as the requirements on aeration and water sources. Section 23 includes a requirement that the living environment shall comply with the needs of a species and an individual. This provision applies equally to production animals and to pets and animals used for recreational pursuits.

In general, it should be pointed out that animals' claims to a good living environment have been strengthened through the Animal Welfare Act, as compared with the previous Act. However, the legislative history also includes a presumption that the provision in Section 23 does not prohibit the keeping of animals in a manner that was legal under the previous Act, such as the keeping of furred animals in cages or horses in stalls.[16]

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14 Bahus 61.

15 Ibid.

16 Ot.prp. no. 15 (2008–2009) 65.

As a result, Section 23 has effectively had a limited impact on animal habitats, but there is a gradual phasing out of older husbandry forms, in accordance with changing social attitudes. Another side of the issue is that restructuring from stall barns to open barns, for example, is costly and cannot be done overnight under the current subsidy schemes.[17]

The living environment of animals must ensure good welfare, a concept that encompasses both good health and well-being. In Section 1 of the Animal Welfare Act, it is stated that one purpose of the Act is to ensure good animal welfare. An important premise for good animal welfare is that the animal is given the opportunity to develop and can master the environment in which it will live its life. This encompasses both physical and mental mastery. The legislative history of the Act indicates that the environment should be in the best interests of the animal and mentions that this can be achieved through environmental enrichment, such as enabling nest building for pigs and hens and sand bathing for hens.[18] If the living environment causes animals to become frustrated or if it limits the possibility of moving or natural development, this can be considered poor animal welfare. The regulations on production animals include several provisions regarding living environments. For example, the regulations on the holding of cattle contain detailed rules on bedding, fertiliser grates, etc.[19]

Case law provides very little guidance regarding the requirements on the living environment, but maltreatment cases illustrate what can constitute serious deficiencies. A Norwegian Supreme Court ruling dealt with about 80 dogs and 14 cats that were kept in dark and unsanitary rooms without the possibility of exercise.[20] Another case, from the Gulating Court of Appeal, concerned sheep kept in too small an area.[21]

When assessing what good animal welfare is, consideration should be given to typical needs of the species. Social species, such as guinea pigs, should be kept together, while species like the hamster thrive alone. Some dog species, such as the Alaskan Malamute, thrive in colder conditions than others, like the whippet. The environment must be adapted to the sensory apparatus of the animals. Fish has a rich sensory apparatus and can perceive things that humans cannot.[22]

Furthermore, the assessment must be adapted to individual needs, such as an animal's age and maturity, as well as any handicap, disease, etc. Different personality traits and experiences must also be considered. For example, a dog that will leave sheep alone thanks to previous experiences with sheep, can run free even when surrounded by sheep, while another dog that has never met a sheep must be on a leash in areas where sheep are kept.

In the legislative history of the Act, it is specified in greater detail what the requirements on good environmental conditions for fish entail. Among other things, it is stated that requirements on good environmental conditions go

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17 Bahus 62.

18 Ot.prp. no. 15 (2008–2009) 108.

19 Regulation of 22 April 2004 no. 665 on cattle holding, Section 22.

20 Rt. 1994 p. 1272.

21 LG-2001-2115.

22 Andreas Føllesdal (ed.) *Dyreetikk* (Fagbokforlaget, 2000) 32.

beyond merely ensuring good water quality. In addition, the fish must not be held too densely, the water temperature and lighting conditions must be adequate, and fish which are kept together must not pose a danger to each other. Bottom-dwelling fish must be provided with dark environments.[23] Current knowledge on fish should guide the catching methods used. Today, trawler catches are often kept in lock for days, for practical and financial reasons. This is at the expense of animal welfare and may be in breach of Section 23 of the Animal Welfare Act.[24]

The first paragraph of Section 23 of the Animal Welfare Act contains a list of what a good living environment shall encompass. The list is not exhaustive. The environment shall provide the opportunity for stimulating activities, movement and rest, as well as enabling other natural behaviours. This includes eating behaviour, herd behaviour for herd animals, social behaviour towards other animals and humans, and other behaviours necessary to maintain a normal mental and physical condition.

4.4 Equipment and Technical Solutions

In addition to the general requirements on living space and a good external living environment, Section 8 of the Animal Welfare Act includes a provision relating to the welfare of animals in the production of meat, eggs, milk, hides etc. This provision is new and applies to operating methods, equipment, and technical facilities.[25] It stipulates that these must be conducive to animal welfare.

In Section 8, second paragraph, the responsibility is extended to those that manufacture, market, and trades in new industrial methods, equipment, and technical solutions. These shall ensure that the solutions are tested and found suitable for use. The Food Act of 19 December 2003 also sets out strict requirements on food production and food safety. The provisions of this Act and in any regulations adopted pursuant to the Act are of significant importance for which methods and modes of operation can be chosen. For example, there is a prohibition in Section 16 of the Food Act on the sale of food products that are unsafe and a prohibition in Section 17 on the sale of, among other things, animal feed that is unsafe.

Rules on industrial methods are typically focused on the husbandry of production animals and commercial activities. The operating methods vary with animal species and traditions. Previously, the operating methods took less account of the needs of the animals, beyond basics such as cleanliness and nutrition. In the past, behavioural restrictions resulting from modes of operation were largely accepted, while poor welfare due to neglect was in violation of the former Animal Protection Act. With the regulations adopted more recently, there has been a shift towards free-range operations, so that animals can perform their natural behaviours to a greater extent than before.[26]

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[23] Ot.prp. no. 15 (2008–2009) 109.

[24] Føllesdal 36–37.

[25] Bahus 66.

[26] Ot.prp. no. 27 (1973–74) 3.

The provision in Section 8, second paragraph, of the Animal Welfare Act also covers methods for handling animals. This includes hormone therapy, horse shoeing, cutting wool, training methods, controlled lighting, etc. In the case of fish, it states that the distribution of feed in a fish farm must give all the fish access to food, to avoid aggression and ensure that weaker fish do not starve to death. Lighting systems should provide light during the day and natural dark at night.

A challenge in relation to farmed salmon is the salmon louse and how to prevent and reduce its occurrence. Several different methods have been developed to limit the use of medications. One method is so-called thermal breeding, where the water temperature is slightly increased so that lice attached to fish are inactivated and fall off. Another method is to keep wrasses with the salmon in fish farms, to eat the lice.

4.5 Supervision and Care

Section 24 of the Animal Welfare Act states that animals should be provided with good supervision and care. It is not enough that a basic framework, such as operation methods, fences and living areas, is in place. The animals must also be taken care of in a manner that promotes animal welfare.[27]

The duty of care for animals requires that the animal keeper has a certain level of knowledge about animal husbandry; many maltreatment cases concern a lack of knowledge and abilities, or poor attitudes regarding animal care. However, economic conditions can also determine what kind of care the animals receive. Underfeeding animals can be a result of poor finances. Another issue is that predators, parasites, and infectious diseases can inflict damage on animals. The duty of care encompasses protecting animals from external hazards.

The vast majority of animal keepers comply with the regulations, but for the few who do not, the supervision of animal husbandry must be effective and the whistleblowing rules on breaches must be designed so that the general public alerts authorities to instances of misconduct. The provision in Section 24 must therefore be seen in connection with the notification rule in Section 5 and the rules concerning the competence of the supervisory authorities in Chapter III of the Animal Welfare Act.[28]

The provision covers both land and aquatic animals and applies regardless of where the animals are located. The duty to ensure animals´ "good supervision and care" constitutes a general standard. This encompasses all subsidiary care duties in the provisions concerning living environment, breeding, release into the wild in Sections 23, 25, and 28, but the provision primarily relates to day-to-day care of the animals, such as feeding, cleaning, etc. Taking care of a dog involves not only washing the dog itself, but also its living area. There is little reason to make strict distinctions regarding the scopes of the provisions, as they will overlap to a certain extent.[29]

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[27] Bahus 71.

[28] Stenevik and Mejdell 266–267.

[29] Ibid. 268.

The requirement for good supervision and care applies to both quantity and quality. Assessment of this must be based on professional knowledge and ethical considerations of how animals should be treated. Considerations that are contradictory must be weighed against each other. However, some requirements are of an absolute character – for example that animals should always be given clean water and nutritionally adequate feed.

The legislative history of the act indicates a number of factors that are of importance to the aforementioned assessment. Animal species, breed, age, stage of development, sex, health status, degree of domestication, fitness, gestation, etc. are all relevant factors. New-born animals and weak or sick animals may require greater warmth and a sheltered sanctuary.

In addition, good supervision and care must be given in a gentle manner. It should inflict the least possible amount of agitation and stress on the animal. Supervision means monitoring the condition and needs of the animal. One must check that the animal is healthy, that it is not diseased and that it has not been injured. This also involves monitoring the surroundings so that no damage can occur.

The absolute minimum requirement on supervision of production animals (excluding fish) is once per day, following from Section 5 of the Regulation on the Welfare of Production Animals of 3 July 2006 No. 885. If there are any indications of predator attacks, the duty of supervision is intensified. In such cases, preventive measures may also be needed. It is stated in the legislative history that while supervision cannot "prevent all injuries caused by predatory wildlife or accidents, good supervision may increase the chances of detecting conditions that require action".[30]

Giving an animal care includes providing the animal with good quality feed, pastures, and water according to Section 24 of the Animal Welfare Act. It also includes protecting the animal from injury, disease, and parasites, limiting the spread of infection, and adequately tame the animals so that they can be handled and cared for. Furthermore, it is as a rule prohibited to forcibly feed or hydrate animals. Sick or injured animals shall be given appropriate treatment and be killed if necessary.

The obligation to provide an animal with care applies until the animal husbandry ceases – either by the killing or death of the animal or when another competent animal keeper takes over the husbandry.

5 The Slaughtering of Farmed Fish

There is no general prohibition on killing animals. The default position is therefore that it is perfectly legal to kill animals. Several fish and animal species are produced specifically to provide meat, such as farmed salmon and cattle. However, there is a high risk that these animals suffer unnecessarily when they are killed. For this reason, it is important that the animals are handled as gently as possible to reduce stress and that the animals are stunned before being killed, so that they experience the least amount of pain possible.[31]

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30 Ot.prp. no. 15 (2008–2009) 109–110.

31 Bahus 137.

5.1 Justifiable Manner

Under Section 12 of the Animal Welfare Act, the killing of animals shall have regard to the animals' welfare. The main rule in Section 3, that animals should be treated well and protected from the risk of unnecessary burdens and strain, is therefore of great importance when assessing what is suitable.

A wide range of regulatory requirements have been made regarding the design of slaughterhouses, the handling of the animals therein and the methods of slaughtering, so as to safeguard animal welfare. As early as the 1890s, questions were raised about whether it was appropriate to legally regulate the slaughter of animals in order to prevent unnecessary suffering. This led, among other things, to the introduction of a provision in Section 382 of the Penal Code (1902), penalising mistreatment of animals. The question of a separate law on slaughtering was not raised again until in the 1920s when it was discussed if bleeding (*shechita*) could take place without prior stunning of an animal. In 1929, after some discussion, a law on the killing of livestock and domestic reindeer was passed which prohibited killing by bleeding without prior stunning.[32]

Today, the most common methods of stunning are using shots and blows to the head. Drugs and gas are also used. There is a requirement on bleeding when killing production animals, but not pets. Thus, in the case of production animals, killing occurs by first stunning the animal and then bleeding it.

When fish die in nets or trawls, this is also a considered method of killing. The handling of the animal in connection with the killing must be justifiable, in addition to the killing itself being so. This means that the animal shall not be subjected to unnecessary stress and that staff at slaughterhouses shall behave in a gentle and caring manner.[33] For example, the physical design of harvesting plants or pipelines must be such that unnecessary strains on the animals are avoided.

The Supreme Court has made a strict assessment as regards killing.[34] In a decision from 1963 concerning a dog who was killed using a rock because it behaved aggressively towards sheep, the Supreme Court found it prudent to use a rock to defend the sheep against the dog (the principle of necessity), but the fact that the person had left the dog without ensuring it was dead, was found negligent. Passers-by found the dog still alive two weeks later and the Veterinary Medical Council stated in a professional statement that the man had not made adequate examinations to ensure the dog was dead before leaving it. For example, he had not checked whether the dog's heart activity had ceased. This case concerned a killing under the old Animal Protection Act of 1935. Under the current Animal Welfare Act, the assessment would have been even stricter.[35]

The legislative history of the Act states that what will be considered justifiable will depend on current knowledge of the animal species, the stage of

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32 Arne Frøslie *Dyrevernloven* (TANO Aschehoug 1997) 74–75.

33 Stenevik and Mejdell 137.

34 Stenevik and Mejdell 139.

35 Rt. 1963 p. 769.

development and the various methods of killing.[36] It is stated that one should avoid methods that will entail a "danger" that an animal may suffer. This proactive principle is not explicitly stated in the Animal Welfare Act, but it is clearly assumed to be an element of what is considered good animal husbandry.

As regards fishing of wild fish, there are specific laws that prohibit certain methods of catching, such as the use of explosives. When angling, it is common to stun the fish by hitting the fish on the head and then bleeding it. It can be questioned whether line or yarn are animal welfare-appropriate methods of killing, given that it can take quite a long time for the fish to die, but this is not discussed in the legislation.[37]

Pest control cannot effectively take place by humane methods alone. Chemicals and poisons are used here, under Sections 24 and 25 of the Wildlife Act of 19 June 2009. The use of rat poison is very common in pest control. The use of the same method of killing in other animals, such as dogs, is prohibited and considered a gross breach of the law. This is stated in part in a 1993 Supreme Court decision.[38]

A general rule for acceptable killing is that the animal must be stunned before being put to death. This implies loss of consciousness. Use of local anaesthesia is not sufficient. It is prohibited to kill animals that are not unconscious. When slaughtered, the animal is first to be stunned with a bolt gun or by an electric current being passed through the brain, and then put to death by the cutting of blood vessels, so that it bleeds to death.

The requirement on stunning applies to all animals owned or in human custody. It also applies to animals that are not used in food production, such as furred animals and ownerless cats held in captivity. Trapped foxes or moose should also be stunned before being killed. The requirement also applies to captured live crabs and lobsters. Although there is a tradition of boiling crabs and lobsters alive, it is not considered appropriate and other methods should be chosen instead.[39]

One aspect of the requirements on killing is that one must ensure that the animal is dead before proceeding in the production process or before the animal carcass is burned or buried. For example, in the Regulation on the Killing of Dogs and Cats of 11 October 1988 No. 998, it is determined in Section 4 that if no bleeding is carried out after the killing, "the person who has performed the killing shall make sure that the animal is dead".

In the case of slaughtering infectious animals, it is often necessary to use methods of killing that prevent blood being spilled, as the infectious agents can spread through blood. In such cases, the use of drugs, gas, or electricity may be appropriate, but the requirement to check that the animal is dead still applies.[40]

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36 Ot.prp. no. 15 (2008–2009) p. 100.

37 Bahus 140.

38 Rt. 1993 p. 1380.

39 Stenevik and Mejdell 147.

40 Bahus 142.

5.2 Slaughtering of Farmed Fish

At harvesting plants, fish undergo various potentially unpleasant, painful, and stressful operations. However, it is difficult to see the result of poor welfare in the form of wounds or increased susceptibility to disease etc. This may sometimes mean that measures to ensure fish welfare are not given sufficient priority.

For practical reasons, the slaughtering process can be divided into six phases:

1. Net pen: Fish are kept in a net pen waiting to be slaughtered.
2. Pressing: Fish are pressed to the surface in the net pen.
3. Transportation: Fish are pumped out of the net pen and into the slaughterhouse through pipelines.
4. Sedation: Fish are sedated before being stunned.
5. Stunning: Fish are stunned before being slaughtered.
6. Slaughtering: Fish are put to clinical death.

I will describe the process, phase by phase, and focus on the relevant welfare issues which must be addressed in each phase.

Net pens containing farmed fish ready to be slaughtered must have conditions that as closely as possible resemble those in ordinary net pens. The only exception is that the fish in slaughtering net pens are not being fed. Since the fish are being starved, the length of stay in such net pens must not exceed 6 days and nights according to the Aquaculture Production Regulation, Section 54. Sick or damaged fish must be brought directly to the slaughterhouse and not be placed together with healthy fish in a slaughtering net pen.

In a survey carried out by the Norwegian Institute of Marine Research, size of the net pens being used ranged from 160 to 9,000 m^3, with an average of 2,800 m^3.[41] The depth ranged from 3 to 12 metres, with an average of 6 metres, and the density of the fish in the pens ranged from 16 to 50 kilograms per cubic metre. Most plants held fish in slaughtering net pens for 2–3 days, but the maximum length of stay varied between 2 and 30 days. The death rate was quite low. In the survey, 58% of the plants reported no deaths at all and 83% of the plants reported a death rate lower than 0.5%. Two harvesting plants reported death rates between 5 and 10%. No occurrences of contagious diseases were reported.

The living conditions in the net pens must be carefully monitored. The temperature and the oxygen levels are particularly important. It is also important not to exceed the maximum density prescribed for ordinary net pens. According to the Regulation on Aquaculture Operations, Section 46, the density of fish must not exceed 25 kilograms per cubic metre. The density and temperature affect the level of oxygen and different fish species require different levels. For example, codfish must have a substantially lower temperature than salmon. When the level of oxygen is too low, compensating measures must be put in place.

The next phase involves pressing fish together in the net pen, so that the fish can later be pumped out of it. According to reports, this phase is the most

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[41] Havforskningsinstituttet [the Norwegian Institute of Marine Research], *Fiskevelferd ved bruk av slaktemerd for oppdrettsfisk* (2006).

stressful for the fish.[42] The pressing is to be carried out as gently as possible, to avoid panic reactions and unnecessary stress. It is important that all the fish being pressed are transported straight to the harvesting plant, so that there is no risk of a fish being pressed more than once.

The strain on the fish increases with the fish density and the length of the pressing. The stress can lead to loss of scales and may cause salmon to undergo colour changes. The activity of the fish increases substantially when they are being pressed, as does the usage of oxygen. The level of oxygen must therefore be monitored throughout the process.

The actual pressing is carried out by tightening the net pen and pressing its contents to the surface. Some fish species, including codfish, have air bladders, which makes it important not to press the fish to the surface too quickly. If the process is too fast, the bladders may burst.

The third phase involves pumping the fish out of the net pen and into the slaughterhouse. This is very stressful for the fish and must be carried out as efficiently as possible, without causing them unnecessary pain. This phase means loss of control for the fish and causes fear. On the other hand, the pumping phase only lasts for a few seconds, and thus does not lead to exhaustion.

It is important that the pipes are dimensioned properly for the number and size of the fish being pumped. The speed of the pumping must be considered. The process must not be stopped while any fish are in the pipes. The length and dimension of the pipes impact on the level of oxygen in the water. Salmon uses the oxygen contained in ½ litre water per kilogram of fish and minute. If the pipeline has 5 litres of water per kilogram fish, the oxygen therein will be consumed if the process stops for more than 10 minutes. If the fish are kept in the pipes due to delays in the process, the risk of suffocation increases.

Furthermore, the pipeline itself must be constructed in a way that ensures the fish are not damaged during transport. The pipes must be smooth, with no sharp edges or seams. The bends of the pipes must have wide angles. The fish must not be exposed to air while being pumped. The Norwegian Institute of Marine Research estimates that salmon should not be exposed to air for a longer period of time than approximately 30 seconds.

The fish are transported to containers containing cold water, only 2 to 4 °C. When the fish enter these containers, the cold water will sedate the fish. This process of cooling the fish must be slow, to avoid stress. The fish may experience panic reactions if the cooling happens too quickly. Extremely low temperatures, below between 0.7 and 1.4 °C depending on the species, will cause the fish to die.

Carbon dioxide can be added to the water to sedate the fish, on the condition that the welfare of the fish are protected throughout the whole process. When CO_2 is added, the level of oxygen will decrease, and the fish will experience panic reactions during the first four to five minutes before becoming exhausted and lose consciousness due to suffocation. CO_2 has no direct pain-relieving or sedative effect, but merely causes the fish to suffocate. Research shows that salmon have substantial stress responses even when only minimal quantities of CO_2 are added to their environment. It is not permitted to use CO_2 to stun fish,

[42] Øystein Rygg Haanæs, "Oppdrettslaks ømfintleg for CO_2" (Nofima, 6 January 2016) https://nofima.no/nyhet/2016/01/oppdrettslaks-omfintleg-for-co2/.

only to sedate them. The use of CO_2 for sedating fish is controversial. Since 2004, it is not considered to be in conformity with good welfare as described by the European Food Safety Authority.[43]

After the fish have been sedated, they must be stunned and slaughtered as soon as possible. The fish must be stunned shortly before or at the same time as they are put to death. The stunning must lead to instant loss of consciousness, i.e., within 0.5 seconds. The state of unconsciousness must last until death has occurred, according to Regulation on Harvesting Plants regarding Aquaculture Animals, Section 15. The methods used for stunning fish include electrocution or striking a fish on the head using a machine. Up until 2013, fish were stunned using CO_2, but this practice is now banned under the Regulation on Harvesting Plants regarding Aquaculture Animals, Section 14 (see passage 4.1).

The method being used must be monitored carefully, to ensure the fish are stunned before being slaughtered. If the automatic method fails, a manual method must be in place to capture any conscious fish and stun them. This requires sufficient personnel and adequate routines. For some fish species, such as halibut and turbot, there are no documented automated stunning methods or machines. The anatomy of the halibut makes it difficult to use an ordinary machine to strike the head with a sufficient blow. The fish species' tolerance for lack of oxygen makes the use of electricity risky, meaning that the halibut might wake up while being cut and bled.

The most accurate method to measure the level of consciousness is using electroencephalography. With this method, the electrical impulses in the brain are measured using a machine. For obvious reasons, this method cannot be used in the case of fish. In a slaughterhouse, one must evaluate the presence or absence of reflexes to determine if a fish is unconscious. The absence of movement in the gills of the fish or the absence of balancing reflexes indicates unconsciousness. A blow to the head of a fish will lead the fish to flop around for a few seconds, before it becomes motionless. If it does not react when being handled afterwards, it is most likely unconscious. When using electricity, it is more difficult to evaluate whether a fish is unconscious or simply immobilised. Using a weak current or the wrong frequency might result in the fish only being immobilised. It is difficult to distinguish this condition from that of an unconscious animal.

The last stage is slaughtering the fish. The relevant method is cutting and bleeding the fish. The fish do not die instantaneously and the effect of stunning the fish must last until death occurs. All fish must be completely dead before being handled further (being filleted, cut up etc.). In the case of fish, this might be difficult to ensure without manual control of the process or having back-up methods available. It is important to cut and bleed the fish quickly when using reversible stunning methods, such as electricity. If these requirements are difficult to fulfil, one must reduce the speed in the slaughtering process or use other methods.

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[43] Sveriges lantbruksuniversitet [the Swedish University of Agricultural Sciences], "Djurvälfärd i samband med avlivning av odlad fisk" (22 February 2019) www.slu.se/institutioner/husdjurens-miljo-halsa/forskning/forskningsprojekt/djurvalfard---avlivning-fisk/.

6 Conclusion

The predominant view on farming fish is that fish are not bred, but produced for consumption. The very wording of the Norwegian Aquaculture Act emphasises this point of view. In principle, there is no legal or logical difference between producing beef and producing fish. Nevertheless, the legal framework governing the production of beef is detailed, with specific requirements when it comes to the slaughtering process. Meanwhile, the legal framework regarding fish harvesting plants is general, with only functional requirements – not ensuring the welfare of fish in the way that is done for mammals.

Up until 2013, stunning fish using CO_2 was still permitted, even though the European Food Safety Authority as early as in 2004 had concluded that this was not in accordance with good animal welfare. Thus, Norway for many years failed to observe this standard of good treatment, which underlines that the interests of the industry unfortunately outweigh the welfare situation of the animals involved.

When studying the phases of the slaughtering process, one can conclude that the process ensures efficient and economical ways of providing food, but does not necessarily take account of the relevant welfare issues. The usage of slaughtering net pens, where fish are kept for days with no food, illustrates the dilemma and underlines the need to introduce specific requirements, instead of only functional ones. When slaughtering sea lions and seals, one must bear in mind a whole range of requirements that have been put in place to ensure the welfare of the animals. Fish, on the other hand, are also living aquatic creatures, but do not enjoy the same level of protection. This can only be described as a paradox. The obligation under Section 3 of the Animal Welfare Act, not to let animals be subject to unnecessary burdens and strains, must apply to all animals in the sea – both fish and mammals.