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Ethics and Credibility of Organic Salmon Regulation

by

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1 Introduction

Animal welfare and other ethical dilemmas of animal husbandry have received increasing attention lately. Both nationally and internationally, among government bodies and NGOs, attempts are being made to regulate and secure basic standards for animals in the agro-industrial complex. Conventional aquaculture research and technology development (RTD) does consider – to some extent – fish welfare. Well-being is instrumental to fish growth and survival. However, fish welfare receives growing attention in its own right. For example, past research on diseases, nutrition, and technology may easily be categorised as part of this body of knowledge. Different welfare aspects are also interconnected in the sense that a higher score on one dimension of welfare entails higher scores on other as well.

The objective of this report is to

... establish how important standardisation of regulations across countries is for the credibility of organic fish products, from the viewpoints of consumers, producers, animal welfare groups, and environmentalists. Establish what constitutes ethical (or acceptable) regulations of organic fish farming, and in particular of organic salmon farming from a viewpoint of consumers, animal welfare groups and environmentalists in selected EU countries.

This paper focuses on the situation in Norway. Several aspects of aquaculture have ethical connotations, as the use/utility of marine production, the distribution of land (coastal areas) and wealth, the matter of appropriate products, etc. Here, however, the focus is on how the target organism is treated, how this affect various societal groups, and how it eventually have an impact on the industrial conduct.

Animal welfare can be divided in two components. The first component is the fish' ability to register pain described by common scientific reductionism: physiology, nutrition, pathology, behavioural studies, etc. The second component concerns the fish' behaviour and whether it alters its behaviour specifically based on its pain perception and transforms this perception into conscious action. This component is subject to interpretation and, hence, guided by an ethical evaluation of the situation.

While the sciences are informative with respect to the biological functioning of the fish and different cause/effect relationships in the human interaction with the fish,¹ the task of defining welfare is concerned with assessing the significance of these findings. The assessment of the information provided by the sciences is influenced by how we (with our particular location in space and time) value fish and what our motivation is for doing so. Our moral obligation towards fish may be different if it was common knowledge that fish have the capacity to experience pain than if fish were considered incapable of pain perception. In other words, while ethics is influenced by science, the influence does run the other way as well.

Different scientific and philosophic aspects of fish welfare were discussed in Reithe and Aarset (1999). The aim here is to establish the various user or interests groups confidence in the organic label and the system that regulate, supervise, control, and convey information on the ethics of organic salmon farming. We use consumer focus groups data and interviews with expert/interest groups to, firstly, establish the importance of standardisation of regulations for the credibility of organic fish products. Secondly, what constitutes ethical regulations of organic fish farming will be established, based on the same sources. But first, as an extended introduction, a chapter on animal welfare that is based on an excerpt from Reithe and Aarset (1999).

2 Regulations and credibility of organic salmon production

Any organic production imposes efficiency constraints on the production of salmon (and a more sophisticated definition of the regulative requirements is necessary). The regulations impose increased costs for the producer. An important aspect of the regulative scheme will therefore be whether the producer trust the regulator and find the regulations legitimate. Trust that everyone in the organic salmon sector (in this case) are exposed to the same regulations. In addition, farmed salmon is a commodity in international trade. There will thus be imperative that organic regulations are common and standard for all potential producers. In this section, the consumers' and expert/interest groups' views on regulation will be presented.

The consumers were interviewed in a focus group setting. This mode of interview is based on a number of groups of eight to ten participants (5 groups in Norway and four other countries) that are led by a moderator in an in-depth discussion on particular subjects. The motivation for

¹ Such as how different feeds influence the fish' health, or how different ways of keeping fish affect their behaviour.

using this method is the interaction provided by in-group dynamics. The intent was to find out what perceptions the consumers might have about the concept of organic salmon. This objective was met by discussing several related themes, in addition to aspects of organic salmon. The expert/interest groups were interviewed by telephone or face-to-face using standardised interview guides.

There are three particular properties of the Norwegian fish consumer. Firstly, the Norwegian fish consumer is probably more knowledgeable about the salmon farming industry than the average European salmon consumer. In addition, in every focus group there is someone that have more than average knowledge about salmon production. Secondly, the Norwegian fish consumer has never been targeted as a main consumer of Norwegian farmed salmon (approximately 98% of the farmed salmon are exported). They may thus not be as trained and critical as consumers, as the European consumer may. Thirdly, moreover, a high percentage of the Norwegian population has fished themselves, which may affect their attitude to fish welfare issues.

2.1 Consumers views

The views presented here are views that were either shared by many of the participants or were interesting and relevant for other reasons. The consumers' views have been edited to some extent in order to make a coherent presentation.

First and foremost, *trust* is the important factor for the credibility of organic salmon. Trust is closely connected to regulation and control. This aspect has at least two central dimensions, first, whether a private or a public certification schemes is the best solution, and, secondly, whether a national or an international regime is appropriate.

The consumers expressed various opinions on where their trust was located regarding organic certification. The perspective was launched that an organic salmon sector should apply to the same regulative system as "land based" agriculture organic production, that is a (private) system where the producers themselves managed the certification, but where the system was controlled by spot-tests from approved authorities. The main argument for this structure was that it would not be possible to oversee the production process satisfactorily unless there was based on some sort of self-control. Others proclaimed that it did not make any difference for the credibility of the organic production whether public authorities or a private certification organisation approved by the authorities was responsible for certification and control.

The control function must be located external to the industry. The available system, however, is not sufficient for certification of organic salmon, the consumers contend. In the consumers' opinion, two aspects have to be covered, there have to be a control system that they can rely on, and it has to have sufficient knowledge of salmon farming. One solution here is that the producers control themselves within a certification scheme where they agree to be checked randomly. The alternative to this system is to build up a huge bureaucracy. The problem, as the consumers see it, is to set up an organisation or a system that can be trusted and that have sufficient capacity and competence to control the producers. In the consumers' mind, the producers will often think "nickel and dimes" when it comes to certification and control. An organisation external to the industry must be responsible for the control. Who, then, will interpret the needs, define the standards, and set up the organisation? The certifying organisation "Det Norske Veritas" (DNV) - specialised within oil and offshore installations and ships, etc. - is mentioned. The respondents are sceptical since DNV is associated with technical classification. Others suggest the Directorate of Fisheries, which has competence in fisheries regulation. One respondent compared the quality system of stockfish with the discussion on organic standards. Stockfish is available in different quality standards dependent on what country the product is exported to:

I have some knowledge of the stockfish (production and market). There you have a Norwegian standard, a European standard, Africa fish and America fish, so there you have different standards with different criteria and different prices. But it is not that I think this is ideal in relation to organic food production, which should be unambiguous, but it may be a market for some (organic salmon) applying to strict criteria and some not.

There is some disagreement over the issue how strict the traditional Norwegian food control really has been. In some respondents' opinion, it has been strict and should remain strict. Others claim that this understanding is a myth.

However, there is an overall general consensus among the consumers that there has to be international standards, at least on a European level, preferably on a global level. It makes no sense if each salmon producer country define their own set of rules. After all, national borders do not limit issues as environmental and ecological problems. On a European level, however, some respondents are somewhat discouraged, and claim that it does not matter if we think the EU are capable/competent or not to set up these regulations - EU will set up their own regulations anyway. There seems to be a widespread scepticism among Norwegian consumers

towards the EU system, which may, partly, be based on the experience that Norway as an EEA member has limited influence on the proposed regulations. Some responses indicated this view. It was questioned, for example, why all nations outside EU should accept EU standards? Some nations may demand stricter rules than EU. Another respondent suggested that the UN system could provide the basis for international standards. Other respondents recognise the participation of several groups of interests, as the environmental organisations, organised consumer groups, the salmon farmers, and public authorities in the design of these regulations.

International criteria and rules are seen as a precondition for a healthy organic production, since the fish is traded in an international food market. But even if an international organic certification scheme was implemented, national food quality control must be maintained in addition. There is scepticism to EU certified organic food among the Norwegian consumers. The consumers claimed that they would have more confidence in the product if it were controlled in Norway. This perspective, it was admitted, may be unfair and tainted by the impression that EU is a compact bureaucracy where economic interests and lobby activity plays a significant role. In the consumers opinion it will be a long time until Norwegians have the same trust in the EU system as we have in our own control and certifying systems.

The debate regarding free float of goods across national borders and the lack of control, confuse the issue of food quality control. With the average citizens lack of knowledge they choose to listen to what the experts says, in this case the veterinary authorities, and the veterinarian authorities are sceptical. However, if consumers in other nations think the same way, every nation would develop its own set of rules. The consumers admit that there has to be some super-national level here, but still (paradoxically?), there is a common belief in Norwegian authorities among the consumers regarding the design of this type of policies.

As an organic product, salmon has one distinct property that limits it from the rest of the spectre of Norwegian organic produce: it is aimed for the export market. If Norwegian producers are selling the salmon to other Norwegians, it is appropriate to set-up Norwegian rules. However, the fish will be exported. Hence, a certification scheme that is based on an international standard that can be approved in many nations would be most convenient for the producer as well as for the consumer.

2.2 *Expert and interest groups*

The consumer views are here completed with interviews with expert and interest group representatives. There are four such groups represented here, categorised as 'fish farmers', 'animal welfare surveillance', 'animal protection', and 'environmental protection', respectively.

2.2.1 Fish farmers

Regardless of the development of a specific organic certification, the salmon farmers as a group will meet environmental labelling. They do not oppose these initiatives; on the contrary, the salmon farmers want to be able to document their capability vis-à-vis environmental demands. In the salmon farmers' opinion, their effort to encourage environmental labelling is an approach towards organic labelling as well. In principle, the farmers agree that organic salmon has to comply with a standard. But, in this process, it is important to establish measurable standards, which the farmers can implement in practice. The salmon farmers also agree that common standards for the whole EU/EEA area would be a tremendous precondition. All farmers would thus be evaluated based on the same standards, and the consumers would be well informed.

The farmers' perspective on the introduction of an organic label is that it represents an opportunity and a challenge. The system, in their opinion, will first and foremost be dependent on a price-cost relationship. Whether farmers produce according to an organic scheme or not, depends on how they view the opportunity for increased profits. But how can the consumers trust the farmers to manufacture the salmon in accordance with agreed standards? Farmed salmon is perhaps the most controlled and inspected food item produced in Norway. "Statens næringsmiddeltilsyn" and "Fiskeridirektoratets kontrollverk"² control and inspect inputs as well as practice in the farms and the processing plants.

The authority of the organic label depends on reciprocity between the involved parties. For the farmers it is hard to imagine how an environmental scheme can be implemented if large consumer groups do not require it (and thus, are not willing to pay for it). But on the other side, the salmon farming industry will be ahead of the development. The salmon farmers will have a complete scheme ready when it is required.

² "Statens næringsmiddeltilsyn" is a governmental body with responsibility for control and surveillance of the quality of food processing in general. "Fiskeridirektoratets kontrollverk" has particular responsibility for the quality of fish processing.

Mixed interests are present here. Institutional changes of the 1990's have opened for stronger consumer action and influence. But economic interests are also working. Not surprisingly it seems that the views and arguments that the fish farmers presents originate from an awareness for the near future approaching Norwegian salmon farmers, more than a special interest in organic salmon farming regulation. For instance the argument that common standards for the whole of EU/EEA is a precondition, seems to be motivated from a fear of discrimination of Norwegian salmon producers. Otherwise there does not seem to be any major objections against such regulations.

2.2.2 Animal welfare surveillance

The European (EU/EEA) nations can voluntarily apply to the convention for animal protection. Under this convention, several more detailed recommendations are designed for different species, which again affects the Norwegian rules on the issue. The Norwegian Department of Agriculture received a first draft of recommendations from the European Council. One section of these recommendations concerned welfare and recommendations for treatment of various animal species in production. The recommendation contains a descriptive section and a section, which details different processes and procedures connected to the farming process. Norway has committed itself to implement EU's laws and regulations on the veterinarian area, which imply an adaptation to EU's laws and regulations on the area of animal protection as well. We have the opportunity to apply stronger criteria, but here the competitive aspect sets in. It will hardly be accepted by our industry if the regulations hamper competition.

Salmon aquaculture satisfies general standards of animal (fish) welfare. The starting point here is to find objective criteria for measuring "good health" and "satisfactorily production". This conceptual work is also in the interest of the farmer. If these criteria are found and implemented, the fish will grow with optimal speed and give a good and healthy product. These principles will comply with organic production as well, as standards for the fish' welfare is part of the organic project. In order to develop legitimate systems for animal protection, the government must have objective criteria for the evaluation of the fish welfare.

As feed resources become scarcer and more expensive, feed producers substitute parts of the feed with other and less suitable ingredients. These might have negative impact on the fish and fish welfare. The authorities, however, will not be able to act before symptoms are detected

and a link between disease, suffering, and nutrition are established. If such cause-effect relationship were established, this situation would also be an obvious issue for an organic certification scheme.

2.2.3 Animal protection

Any standard that implies an improvement for the fish also implies progress for the animal welfare interests. The organisation's aim is ideological, but has a pragmatic agenda where the organisation's goals are interpreted as utopian.

In this respondent's opinion, the adjective "organic" must be connected to something else. There is a belief that the standard of an organic product will be higher in Norway than in other countries, due to cultural differences in how animals in production are valued.

Inspections must be used to verify whether the farms comply with welfare standards. There exist an apparatus for this kind of inspections in Norway, "Statens dyrehelsetilsyn"³, which again administer a network of local animal protection agencies. This agency makes decisions, but more severe incidents will be reported to the police. The local agency is composed of representatives from the political authorities as well as from the animal protection association and similar organisations. Professionals such as the county and the district veterinarian manage "Statens dyrehelsetilsyn".

2.2.4 Environmental protection

The respondent was not very keen on the concept of organic salmon farming. Sustainable harvesting of seafood resources requires that the biodiversity as well as the ecological habitats will be maintained. One of the requirements of the Brundtland Commission was that each generation should have the same opportunities. We would like to expand that to include the freedom of choice. In other words, that our salmon farming activities today will not have any irreversible effects to the range of choices available for future generations. It is paradoxical that farmed salmon should be labelled as organic. As opposed to what – wild caught fish?

One of our major concerns in relation to salmon farming is the intensive growth of the industry. One matter is the environmental concerns they air in public, like dissociate themselves from gene-manipulation of fish, but how willing are they to defend those decisions

³ "Statens dyrehelsetilsyn" is a governmental body with responsibility for the control and surveillance of the health and well being of animals in captivity.

if the market should change to a demand of such fish? There are especially three factors that are important regarding salmon farming, in the opinion of this respondent. The feed. The respondent do not approve that 3 kilo herring is used to produce 1 kilo salmon, neither in terms of the pressure on the eco-system in the region where the pelagic fish are harvested, nor in terms of food safety, and argues that the salmon farming industry is an aggressive agent on the protein market. For salmon farming to be organic, a requirement is that it should not use any other sources than offal from the fish processing industry. Location. Here, as well, the salmon industry is too aggressive in its attempt to expand to locations that may be vulnerable to such activities. Gene technology. Norwegian salmon farmers do not produce gene modified salmon, and they have stated that they do not intend to do so either. However, the respondent does not feel confident that this will remain the industry's approach.

2.3 *Brief summaries*

The views of the Norwegian consumers:

- International standards are needed, but some reservations against regulatory schemes from the EU system are raised.
- Advocates both external controls of organic salmon producers, and alternatively self-control with spot tests.
- There are differences in opinions of which organisations and institutions that are best suited to regulate and enforce regulations on organic salmon production.

The views of Norwegian experts and interest groups

- The fish farmers call for measurable standards, both in order to implement the requirements and to evaluate the conditions for competitors in other nations.
- Reciprocity between producer and consumer will be conclusive for the success of the organic innovation.
- Farmed salmon is an export commodity and have to comply to international requirements.
- Regardless of the organic regulative system, Norwegian producers are obliged to follow EU rules and regulations (ref. the EU/EEA agreement), and food quality and animal health are already secured by national institutions.

3 The concept of animal welfare

3.1 *Moral status*

The issue of animal welfare in fish farming is important of two reasons: Fish must be kept happy because it improves the food quality, and fish must be kept happy because we have an obligation to do so - fish (and other animals in captivity) have rights. The first argument is technical and argues for increased efficiency. The second argument is based on an ethical evaluation, and if fish has these rights, it has moral status. The question then, is on what criteria is anyone given moral status? And in our case: do fish fulfil these criteria? Three criteria used for assigning moral status are life, sentience and moral agency (Warren, 1997).

Albert Schweitzer used life as a single criterion for assigning moral status. Moral status should, he argued, be assigned equally to all living organisms from bacteria to human beings. Schweitzer argued that other standpoints could not be justified, except on the basis of our own arbitrary preferences. Many other philosophers do not, not surprisingly, share this idea. The list of critics is long and will not be discussed in full here⁴.

Sentience, that is, having the capability of feeling pain and pleasure, is another concept used as a criterion for moral status. Peter Singer used sentience in an early attempt of the "new" movement to advocate animal rights and to argue against an anthropocentric view (Warren, 1997). Singer argues that all, and only, sentient beings have moral status, because only sentient beings have interests. Hence, the interests of all sentient beings should be equally accounted for. Non-sentient beings may have needs, but they experience neither frustration nor suffering when their needs are thwarted, nor pleasure when they are met. Consequently, they cannot "mind" what happens to them and thus we have no moral obligations in our treatment of them.

Moral agency is the strictest criterion for moral status since only man has the ability to fulfil this claim. A moral agent is defined as an individual with free will and the ability of practical reasoning. Kant argued that being a person is a necessary and sufficient criterion for moral status. In the strictest form, the term "person" may here be interpreted as equal to a moral agent (Warren, 1997; Wetlesen, 1993), implying that if humans have any obligations towards non-humans, these will be indirect and derived from direct duties that we owe to other humans or ourselves (Wetlesen, 1993).

⁴ See Warren (1997) for a thorough discussion of the theory.

Finally, the properties of moral status are much argued. Should moral status be assigned equally to all organisms fulfilling the criteria and thus give rise to equal rights and human duties, or should they be given a different moral status according to how well they fulfil the criteria?

3.2 Definition of fish welfare

The research in animal welfare is concentrated around two interrelated problems: how to define animal welfare, and what parameters should be used in the evaluation of animal welfare (see chapter 2.3). It is difficult to give a precise scientific definition of animal welfare, but a broad working definition that encompassed physical and mental health, and the capability of adapting to its environment without suffering is proposed by Duncan and Dawkins (1983) [cited in Duncan (1996)]. Later two trends seem to have evolved, those who highlight the practical implications of a definition, that is, how welfare should be measured, and those who explore the theoretical aspects of animal welfare.

Stress have been emphasised as an important indicator by those taking the practical approach to animal welfare. However, the use of stress as an indicator of welfare has been criticised for its negligence of the fact that stress is involved in natural and necessary life sustaining processes and in presumably rewarding activities such as sexual behaviour. Moberg (1996) recognises these weaknesses and propose that the effects of stress, rather than stress itself, should be used as an indicator of welfare. He divides stress in three general stages: perception that a threat to well being exists, the biological response, and the consequences of the stress response to the animal - the so-called biological cost of stress. The biological responses, that is, changes in behaviour, activation of the autonomous nervous system, and the secretion of hormones by the neuro-endocrine system, alters the biological functioning and diverts the resources away from non-stress functions. If the animal is faced with a prolonged stressor, the shift in biological resources has cumulative effect on the animal that result in escalating biological costs and may result in the animal entering a pre-pathological or pathological state. It is thus the biological cost of stress that determines whether the stress is merely a minor episode in the animal's life or whether the animal is suffering from stress. It is when the biological cost of coping with the stressor is too large that a pre-pathological state develops and suffering occurs. Indicators of a pre-pathological state may be suppression of the immune system, changes in behaviour, or failure to reproduce.

Duncan (1996) defines animal welfare in terms of feelings, which is defined as "a specific activity in the central nervous system of which the animal is aware". What is suggested is that more advanced species have evolved cognitive representations of their needs, usually referred to as wants and desires, which motivate behaviour in a more flexible manner than reflexes. Duncan proposes that welfare have all to do with these conscious states, that is, with the satisfaction of wants and desires rather than needs. It is in fact stated that the needs in themselves are irrelevant to welfare and that it is the desires or wants or emotional states associated with the needs that are of paramount importance. This statement is exemplified by considering the emotional response to certain physiological states. An animal that shows the physiological signs of stress may either experience the negative feeling of stress or the positive feeling of excitement. According to Duncan (1996) the "feelings approach" gives more obvious methods of assessing welfare:

"We must devise methods of asking animals what they feel about the conditions under which they are kept and the procedures to (which) they are subjected" (Duncan, 1996).

Sandøe (1996) suggests that a definition of welfare should comprise features that are common for animals and humans. This structural similarity is the degree of harmony between the animal/human and its environment. Thus, even if it exists aspects of welfare that are uniquely to humans or uniquely to animals, by taking this approach it is possible to use the results from human research to validate the more indirect methods used in the study of animal welfare (Sandøe, 1996).

The fish' ability to enact "natural behaviour" is central to the concept of animal welfare. The animals shall be protected against unnecessary suffering imposed by humans with a specific intention. But fish density, for example, is still not a sufficient measure of fish welfare. High densities may under certain circumstances produce even less stress than lower densities. Welfare may be defined as "how well an animal is capable of regulating its biological functions according to the environment". Regulation of biological functions is explained as how well the fish adapt to life under farmed conditions, or what the fish has to do to normalise an anomalous situation. The definition comprises behavioural, physiological and immunological factors. Suggested indicators of good welfare are normal regulation of physiological processes, normal behaviour without aggression, good appetite, normal growth and no signs of fear or tissue damages (Damsgård, 1998).

The approaches of Sandøe (1996) and Duncan (1996) are probably far too advanced to be suitable for the assessment of fish welfare. First, the scientists still argue about whether fish is able to feel pain. Secondly, in both approaches a high level of comparison between humans and other mammals is needed. Fish is an aquatic, cold-blooded animal fundamentally different in terms of habitat demands and most other needs. A comparison with humans or other mammals in order to evaluate their feelings or preference satisfaction may thus not be possible or appropriate. Both approaches do, however, give interesting perspectives in a debate in which the question of welfare often is reduced to measurement of fish density in the net pens or the presence of a particular hormone.

3.3 *Evaluation of fish welfare*

In an increasingly competitive salmon farming industry, resources are directed at minimising the largest cost factors. Fish feed is the single largest cost component of conventional salmon production. The main components of fish feed are fishmeal and marine oils. A coming shortage and thus increased competition for marine resources will occur and rise the price of these resources. Sub-optimal resources might be used, and deficiency diseases will be a possible effect. The problem is that action cannot be taken until symptoms are registered and a connection between illness, suffering, and malnutrition is documented. This rises ethical questions of concern for the well being of salmon in farms. Deformities in the spine of reared salmon are an increasing problem. Lack of mineralisation of bone tissues was one of the possible factors causing this problem, and different nutritional factors that might be related to the process of mineralisation were investigated (Bæverfjord, 1998).

Recent research has documented the occurrence of an endorphin-like substance in the fish-brain. In mammals, this substance is known to reduce pain. The question then is why fish have this substance if they do not have perception of pain?⁵ Most animals exhibit behavioural patterns of avoidance when induced to stimuli that may cause damage to tissues, but this behaviour is not necessarily a sign of pain. Pain is defined as the subjective interpretation of signals from stimulated nociceptors. The system is described as a necessity for survival. The interpretation of pain is assigned to the neocortex, a part of the brain that is highly developed in mammals and that fish almost entirely lacks. It is suggested that fish has little or no ability to interpret the signals from the nervous system as pain, and that responses to harmful stimuli are

⁵ Personal message from Knut Rønningen, president of the Norwegian Veterinarian Association.

merely reflexes (Velle, 1992). However, there are divergent views on the issue of pain perception. The telencephalon, the part of the brain that interprets smell, is bigger than assumed reasonable if interpretation of smell is the only function assigned to it (Brattelid, 1999). It is argued that a direct comparison of the brains of phylogenetic very different species does not give exact knowledge about the functions of the different parts of the brain. It is thus possible that other animals have a different brain structure that provides it with the same ability to interpret signals from the nociceptors as pain.

Much effort have been put into definitions of stress and factors that influence stress in fish, but mostly with dubious results (Brattelid, 1999). Despite the dubiousness of the definition and Levine's characteristic of these attempts as "I am not certain whether one who undertakes this task either has an enormous ego, is immeasurable stupid, or totally mad" (1961) [cited in Brattelid (1999)], two definitions are provided:

Stress is an extreme inner or outer stimuli (stressor), communicated through receptors in the organism, which causes complex physiological and behavioural changes (Wendelaar Bonga, 1997).

and

Stress in fish is a physiological response to biotic or abiotic factors, which exceed the normal capabilities of the homeostasis or the stabilising processes and their ability to control the normal physiological processes (Esch and Hazen, 1978).

The response to stress is normally grouped in three categories. Primary responses occur in the endocrine and central nervous system, and may be observed as increased production of hormones, mainly cortisol, adrenaline, and noradrenaline. Secondary response is noticed as changes in blood and tissues occur, and may be observed as increased gill perfusion, increased sugar levels in blood, and reduced time of coagulation. Tertiary response occurs at the individual level, and may be observed as reduced growth, lower tolerance towards infectious agents, lower reproduction and survival and changed behaviour (Brattelid, 1999). The physiological response to stress will be fairly similar between species, but the behavioural response will vary widely according to the swimming capabilities and natural habitat of the species. Stress may be induced through a wide range of factors such as water quality, care and handling, temperature, feed content, presence of infectious agents, individual interactions, transportation, exposure to light and sounds. Stress is, however, a normal part of the life of fish and is a necessary component to ensure the well being of fish.

Ethical correct slaughtering is defined as quick and effective killing of anaesthetised fish, performed in such a way that the slaughtering causes no unnecessary pain or suffering. One important point of divergence between organic and conventional salmon farming was whether the fish should be killed before bleeding. An old truth in salmon production (and fish processing for that matter) is that fish shall be bled alive in order to ensure complete drain of blood. This is important to achieve high quality under storage. The rationale here is that if the fish is not able to feel pain, the dispute between researchers about whether fish is able to feel pain or not, will not be conclusive for the method of slaughter.

4 The composition of ethical regulations of salmon aquaculture

It is in general difficult to map how respondents perceive animal welfare issues when it comes to fish. In more abstract terms, people agree to the fact that animals in captivity must be treated in accordance to some normative rules. But in practice, respondents' sentiments towards fish do not seem to be particularly high.

4.1 Consumer views

The consumers disagree somewhat to whether they care about the welfare of the fish. To some consumers it is important that the fish have a reasonable amount of oxygen, a reasonable amount of food, the possibility to choose appropriate water-temperature by swimming up or down in the water column, and reasonable space. "Enough space", "enough exercise", "water circulation", "appropriate feed", and "clean environment" are important aspects of fish welfare. It should also be allowed to spawn and propagate.

Other consumers argue that the fish should be able to act like a free fish, a demand difficult to meet in a fish farm. The absence of diseases can be seen as an indicator of the quality of the welfare of the fish. Today wild salmon is synonymous with a quality stamp. Other consumers again do not care about the welfare of the fish at all. They also argue that stress is a natural part of the life of a fish. The problem here, some consumers argue, is that the scientists inform us that fish have a sensory system more like us and that it can feel pain, and most agree that fish feel pain and stress. But what does this mean for our perception of the situation for the fish as a farmed animal? The consumers agree that fish have the ability to feel pain. Some have stopped fishing themselves. Most people, however, fish and kill the fish instantly - and thus show some consideration for the fish's suffering.

The consumers realise that animals suffer pain and stress when they approach the slaughterhouse, but as consumers we seldom consider this when we are out shopping. As consumers, we are quite cynical.

The consumers seem to agree that fish in farms have some sort of rights, rights not suffer of malpractice, to have a dignified life, etc. But the fish does not have any legal rights. In an ecological (or environmental) perspective, fish have rights to go up rivers that are not polluted. One consumer has ...

... the same associations of farming of deer as of farming of salmon. The deer is easy to visualise it in the wilderness, with its instincts alive, but our ordinary domestic animals are changed. The cow is quite lazy, while the deer is full of instincts. In a way I think the salmon is so wild... Maybe it's just in my head. And then it is quite dramatic to close them in.

There are disagreements here, too. Some consumers have the perception that to talk about fish' rights is "silly". It is mentioned that farmers can be punished for mismanaging animals. If domesticated terrestrial animals have these legal rights, they apply to farmed fish as well. There is a growing concern for this issue, and "Rådet for dyreetikk"⁶ are working with questions regarding fish and slaughtering.

To some fish welfare is an aspect of flesh quality, to others fish welfare per se is in focus. The standards of living can have an impact on meat quality. But if we can see what stress can do to the quality of salmon meat, then we would have a new approach to the issue of fish welfare, some respondents contend.

Differences and similarities between animals and humans, and the impact of this insight in our attitude towards animals, are a question of continuous debated among philosophers. There is scepticism to transfer our understanding of human life over to the life of animals. There is a big difference. On the other hand, we are not here alone but coexist with animals. It is not one ethics for animals and one for humans, but one ethics for our existence side by side. It can be reduced to what one appreciate. Some people like to live in the city, other in the woods. On the background of what we appreciate, we have a tendency to transfer this to animals. It is difficult to say anything about what are the animals likes and dislikes. What is a "good" animal life? As one of the respondents said:

⁶ Council for animal ethics is a committee discussing contemporary issues of animals (and fish) ethics.

I am not sure domestic animals are suffering so much. Maybe they even have better life than the wild animals. They have still food enough, they have shelter.

4.2 *Interest/expert groups*

4.2.1 Fish farmers

The salmon farmers advocate the precautionary approach in the matter of fish welfare. The farmers can always improve their production, and fish welfare is a coming issue. People in general care about the welfare of animals, also fish, in captivity. And the farmers care about animal welfare as well as food safety issues.

One of the aspects of the proposed organic regulation that the farmers opposed, however, was the suggested maximum fish density. In the farmers' opinion, this limitation was not properly explained. The farmers accept the general arguments aimed at animal welfare issues, and want to propose a certain "movement volume". Based on this principle, which also include evaluation of temperature and salinity, the farmers are willing to accept a standard limit to fish density.

Slaughtering techniques is not yet a big issue among salmon farmers - at least not from the standpoint of animal welfare issues. The reason for that is that veterinarians recommend the conventional method with anaesthetisation and cutting of gills. In the opinion of the farmers, there are compatibility between the animal welfare aspect of production and the commercial objectives of the industry. Good fish health increases the production (as simple as that).

An ethical debate as such is probably not present among salmon farmers. Indirectly, however, they are concerned about ethical questions, for example regarding diseases and preventive action. The issue of escapements is particularly interesting. The production of sterile salmon is suggested as a solution to the problem of harmful escapements and potentially degrading the environment. This form has a high frequency of deformities. To the farmers it is unethical to support the development of this type of fish as long as it leads to more suffering for the fish.

4.2.2 Animal welfare surveillance

To pay attention to animal welfare is to take care of the animal and take its natural needs and instincts into consideration. This includes its ability to move around, the availability of correctly composed feeds, and not exposed to sufferings inflicted by humans. However, the

concept of animal welfare that informs the regulative process, is based on the requirements of "warm blooded" terrestrial animals. Fish are in some respects different. In particular two physiological concepts are important: Can fish feel pain? And if they can, are they able to make conscious action based on this registration? Some scientists claim that fish lack a system to register pain and transform pain to conscious action. But then again, an endorphin like substance is produced in the brain of the fish. This substance is used to reduce pain in mammals. Why should a fish have this substance if it has no sense of pain? Escape is reflex and not the same as conscious action. If the behaviour is based on conscious action, then the concept of suffering kicks in.

A precautionary approach here would be to take action as if the fish has a sophisticated pain perception, even if we still do not know for certain. This realisation will be a significant guidance in our administration of industrial farming. Our ethical tradition tells us not to expose the animal for more suffering than strictly necessary to reach the product we want.

It is not necessarily more stressful for a fish that there is a higher number of fish in the cage. Research document that under some circumstances, more fish, and higher densities provides less stress for the fish.

Animal welfare depends on the public opinion at the time and thus on the interpretation of sentiments in the population. How the population perceives animal welfare at the time is conceptualised as norms on the issue of animal welfare. Animal welfare has two major components. First, science provides (reductionistic) information on issues as physiology, nutrition, and pathology. And secondly, ethical acceptance and cultural perceptions of "right and wrong" (norms) determines human action on the issue of animal welfare. Norms vary over time, as suggested above. The focus on animal welfare issues and ethics are growing at present.

From an ethical standpoint, it is a dilemma that it is not allowed to treat fish for diseases within the proposed organic concept. The argument is that it causes un-necessary suffering for the fish. The problem is that fish cannot be treated individually, fish has to be treated in groups, which means that healthy fish, as well, will be treated as if they were sick. This aspect raises ethical dilemmas.

4.2.3 Animal protection

There is an (increasing) ethical engagement in the population. People want a guarantee that the animals have had a good life before they end up in the counter in the supermarket. The reasoning is that if the animal have had a good life, it is probably healthier and the chances are less that they will eat a bad product.

The animal protection interests have no campaign against fish or fish farming. People are not used to think about fish as living organisms that have a pain and stress perception. It is a matter of the place of the fish in the zoological hierarchy. Information and an increasing public consciousness will probably initiate a growing engagement.

Animal welfare is a precondition for the animal to have a good life. More welfare means a better life, better product, and better fish meat. Thus, more welfare means better product quality.

The fish density is an obstacle to the fish welfare. The density is, today, so high that it increases the stress level and thus also (automatically) affects the immune system. It is a biological law that says that when the stress level rise, the immune system decrease, and the animal will be more receptive for diseases and parasites. Reduced densities improve this situation.

4.2.4 Environmental protection

The respondent has a problem of relating to the question of fish welfare, and instead place the issue in another perspective: The fish welfare is not an important issue in this context. Since a large quantity of herring ends up in salmon feed it means that salmon has a higher "purchasing power" than a Russian woman does. The discussion about ethical issues in relation to salmon welfare shows a lack of understanding and empathy towards the situation of other human beings.

4.3 Brief summaries

The views of the Norwegian consumers:

- Somewhat ambiguous to the content of the issue of fish welfare, but consensus that those necessary life-sustaining requirements are met.

- Stress is a key issue. What is a 'natural' level of stress? Stress decrease with increasing fish densities up to some level – is stress the appropriate indicator to determine optimal fish densities?

The views of Norwegian experts and interest groups

- The salmon farmers are willing to accept fish density regulations, defined by a "movement volume" criterion, which also include evaluation of temperature and salinity.
- The concept of animal welfare that informs the regulative process is not adapted to fish as it is based on the requirements of "warm blooded" terrestrial animals.
- How humans act on the welfare requirements of fish is determined by norms, based on ethical acceptance and cultural perceptions of "right and wrong".

5 Discussion

Wild fish has no rights in the sense that it has rights not to be eaten by predators. A farmed fish, however, have rights. A farmed fish has rights to a decent life, to maintain an immune system, and to resist diseases.⁷ The fish will not necessarily have these rights if it is kept in a net-pen under too crowded conditions. In that case, the immune-system protection may be reduced, diseases will spread, and the number of sick fish will increase. Chemotherapeutic treatment might in this case be a necessary solution to limit the scope of the diseases.

But what constitute these rights? To what extent shall we care about fish? And what does scientific data on fish physiology etc. really mean? Measurement of welfare is a problem. Stress hormones can be measured, but this is not a significant measure of welfare. A combination of stress hormone level and behavioural pattern is probably a better method to coin a useful concept of fish welfare. The crucial question is whether the changes from "natural conditions" transform the situation for the fish to a form of illness. Humans have made the decision to put fish in roles that will cause suffering for them. The difficult judgement is how to weigh the degree of suffering for the fish against our ethical tradition. Normative laws guide our action on this area. Normative laws, as the Animal Protection Act, are supposed to reflect what society perceives as acceptable. There is an increasing awareness of ethical questions related to animal protection, and such laws are thus transformed and

⁷ This definition of 'fish rights' is extracted from an interview with the 'animal protection' representative.

transformed again in a continuing process. Reciprocity between legislators, scientists and the general public is necessary in order to both understand the technicalities and the scientific knowledge of the issue, and to interpret the sentiments of the general public. A pure scientific angel may reduce fish welfare to the level of a particular hormone, while a pure consumer/public angel may be 'whimsy' and based on scandals, fear, uproar, and sentiments without reflection. Interpretation must be based on our ethical tradition, which, on this area, tells us not to expose the animal for more suffering than necessary in order to acquire the product we want.

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