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Recommendations and research gaps

Latest News from OrAqua

Welcome to the second OrAqua Newsletter

Also read the supplement
“Recommendations and research gaps identified from the first stakeholder meeting in Istanbul”

First step taken toward developing the organic aquaculture

By Jean Paul Blancheton, Ifremer, WP1-leader

During two days in October, 80 representatives from the organic aquaculture sector met in Istanbul and exchanged ideas, visions and beliefs at OrAqua's first open platform meeting. The meeting was held back to back with the IFOAM general meeting and the Organic World Congress taking place in Istanbul.

The ambition of the OrAqua project is to contribute to the economic growth of the organic aquaculture sector in Europe, by suggesting improvements for a future regulatory framework of the European organic aquaculture.

The improvements have to be supported by science based information in line with the organic principles and with consumer confidence.

Consequently, one of the first important tasks is to summarize the recent results from scientific publications, that could contribute to the current organic regulation and to present the information in a easily accessible way to the main stakeholders of the sector in order to get their feedbacks concerning

1. Their compatibility with the organic principles
2. Their possible impact on the economic sustainability of the sector

3. Their impact on the confidence of the consumers regarding the organic label.

A first step toward this goal was achieved during the multi-stakeholder platform meeting held in Istanbul in October. The meeting was organized in such a way as to trigger the exchanges of views and information between the project partners and the stakeholders. This was implemented using a combination of group and round table discussions, dialogues in café format and plenary presentations and discussions.

The overall vision of the OrAqua project is to consider it as one of the many contributors to the global organic sector, and this is the reason why the first open platform meeting was organized back to back with the IFOAM general meeting and the Organic World Congress in Istanbul.



The OrAqua meeting was held back to back with the IFOAM general meeting and the Organic World Congress in Istanbul. Photo: Marie-Louise Andersen.

This organization enabled the active contribution of representatives from the overall organic sector to the OrAqua meeting.

In total about 80 participants from 15 countries contributed to this first platform, and the feedback after the meeting were quite positive.

The difference is our strength

We asked three of the stakeholders to share some insight into their experience of the platform meeting.



*Antonio Campanioni,
Istituto Certificazione
Etica e Ambientale*

“There are many similarities between organic farming and organic

aquaculture, but different time scales. I have seen the beginning of organic agriculture, and I see the same happening to organic aquaculture, but many years later.”

“We are in a way bound by regulations, that are a bit too strict compared to what the sector can afford. For organic farming we had more time to adapt and getting the rules more toward the vision we had of organic farming and principles. I think we need to massage the regulation and find solutions to help the sector striving to cope with them. We also need to address policies to increase the number of producers and to increase awareness of the consumers. These kinds of events can help fuel the motivations and passion, to make them concrete and create something better.”

The potential?

“I see that we came up with a group of consumer organizations from different countries. We are taking this opportunity of being here at the world organic conference in Turkey; we are in connection with many people from the organic movement and we are informing them. Maybe we can use this knowledge-sharing, to focus on and to get more development in the sector.”



*Regine Andersen,
Organic Norway (Oikos)*

“I have learned a lot, mostly of the challenges for organic aquaculture. I have seen a lot of engagement from people wanting to make the best of organic aquaculture. But I have also seen that there are really big challenges.”

“Coming from the consumer side, I see challenges particularly in communicating with organic consumers. It is interesting to see how this is discussed. There is an openness and understanding of this as a big challenge. I think it is important to truly communicate with the consumers. For example the juvenile question: how to get enough organic juveniles and should we continue to accept non organic juveniles and for how long? There are several discussion points like that.”

“Another point is to communicate with organic consumers who are concerned with the following question: how organic is, in



fact, organic aquaculture? They might have difficulties with associating organic aquaculture with what they know from organic agriculture – with the organic agriculture principles after IFOAM. There is also some concern that organic aquaculture might reduce the trust into organic as such. It is not a shared opinion, but it was evoked in some groups.”

The potential?

“It is difficult for me to oversee the potential of the project, because OrAqua is so big and it includes so many branches. It has huge potential in many ways. From the consumer side – the organic associations – the potential of communicating and creating arenas for communication between producers, consumers and researchers. There is the potential to create a greater understanding of what is needed and how to get further in developing the organic aquaculture. It seems to me that OrAqua has the potential to bring new ways of thinking into the discussions – perhaps this is dependent on managing to bring more representatives of consumers into the discussion.”

Around 80 representatives from the aquaculture met at the OrAqua stakeholder meeting in October. Photo: Marie-Louise Andersen



*Emmanuel Briquet,
Searen:*

“The event has been very inspiring, overall a criss-cross of different people of different origins, trying

to put together people who normally don't really exchange, in order to have a better view on how the organic certification should evolve in the future.”

“Personally I was happy to see that some issues, that have not been addressed in the past, was addressed. I hope these issues will be implemented and addressed to the commission, in order to make the standards evolve towards more sustainable practices.”

“Right now the approach is to push the methodology without many concerns about the effects – so pushing potential performance indicators in order to achieve a goal instead of achieving a way.

The potential?

“I believe OrAqua has the potential to be a game changer in the industry. Putting together all these different people may allow the process to be seen from different angles. Not only the technocratic angle or the scientific angle, or the consumer angle, but a diversity of angles. And it seems that we can all agree: when we have different viewpoints, talking to each other make us share opinions. And that could potentially revolutionize the way we see organic standards.”

OrAqua progress and plans forward

By Ingrid Olesen,
OrAqua Project Coordinator

Thanks to highly committed and engaged participants, excellent arrangement and facilitation of the first stakeholder event in Istanbul last year, we got valuable feedback and input to finalize the review process of organic aquaculture. This also made a good basis for preparing for the next stakeholder event, and make this even better. The second stakeholder event in the project will be organized in Rotterdam on the 19th - 20th October 2015 in conjunction with the EAS conference (Aquaculture Europe 15, annual conference of the European Aquaculture Society see www.easonline.org).

Before the next event, scientists in WP2 (Production related issues) and WP3 (Socioeconomic Issues) will continue and finalize the methodical and comprehensive state of the art reviews on existing data and literature sources, which together with the



The OrAqua stakeholder event was held at Yeditepe University, back to back with the IFOAM organic congress. In the right picture is the view from the university - a picture of former Turkish president Kemal Atatürk. Photos: Marie-Louise Andersen

stakeholder feedback, will identify factors that may hinder the social and bio-economic development of the European organic aquaculture sector. Before the completion of the review in June 2015, the scientists will meet in a workshop in Vodnany, Czech Republic in March to secure a proper integration of the results from the two WPs, and to prepare

for the next stakeholder event. The data and information from the reviews are utilized in WP4 (Integration and Internal Communication of results), where WP partners will formulate, consolidate and communicate the outputs of WP2 and WP3.

In October 2014, WP4 delivered a report with extracted and synthe-

sized information from WP2 and WP3 and feedback from the first stakeholder event. A summary was presented in an easily conceivable format, including preliminary recommendations. When approved by the Commission, this will be published on the OrAqua website.

Continued next page



The review reports will be further elaborated before the completion of the reviews in June 2015. An updated and easily conceivable summary of the results will be shared with the stakeholders before the event and discussed at the stakeholder event in Rotterdam.

Furthermore, a main task on the event in Rotterdam will be to get input from stakeholders by carrying out a Multi Criteria Decision Analyses (MCDA) session. At the event, stakeholders' values, preferences, priorities and experiences will be gathered, and analyzed with MCDA techniques and then incorporated in WP4. MCDA is useful for structuring and solving decision and planning problems involving multiple, and sometimes conflicting, criteria, cf. Fact box . The purpose is to support the decision making when facing such problems.

Typically, a unique optimal solution for such problems does not exist, and it is necessary to use decision maker's preferences to differentiate between solutions. Surveying needed for getting data of stakeholders' preferences

for the MCDA will be carried out in the stakeholder event in Rotterdam as a part of the facilitation (provided by WP5). The results from the MCDA will then feed into the process of drafting the recommendations in WP6.

In the meantime, we welcome all feedback and input from stakeholders through our website (www.oraqua.eu), that is managed by WP1 leader Jean Paul Blancheton (jean.paul.blancheton@ifremer.fr), or to the project manager, Åsa Espmark (asa.espmark@nofima.no) or the partners.

The interaction with the stakeholders in the organic aquaculture sector is critical for the success of OrAqua, and we hope to see many stakeholders at the OrAqua event in Rotterdam. A total of 80 participants will be invited and get their travel and accommodation costs covered. However, other interested actors are also welcome to participate on their own costs after signing up to WP4 leader Alfred Jokumsen (ajo@aqua.dtu.dk), who is responsible for organizing the event.

Fact box

Multi criteria Decision Analyses

Multi criteria Decision Analyses (MCDA) techniques will be used to assess multi-stakeholders experiences and perceptions on key issues for the economic development of organic aquaculture.

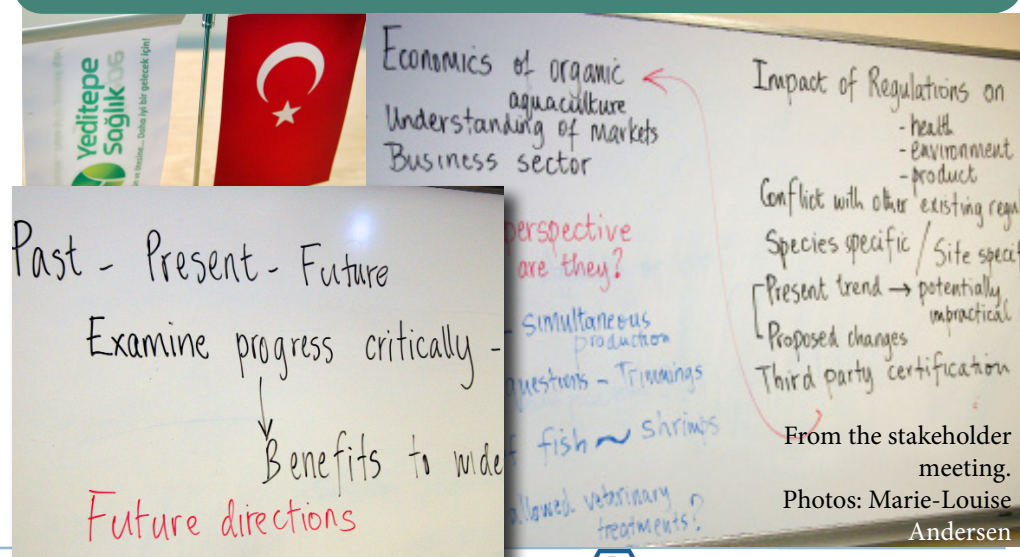
Management of organic aquaculture is significantly complicated by the fact that usually there are more than one set of objectives and therefore criteria of relevance in evaluating its performances. The problem is not just one of maximizing the fish health and welfare but also to improve environmental interactions, feeding and nutrition, farm economics and competitiveness.

All the above should balance within the framework of the organic principles.

The goal of the optimization process using MCDA is to assist in ensuring that we arrive at the best possible trade-off for a given problem.

As in "real world" situations, solutions to problems are reached as compromise solutions, resulting from trade-offs between various conflicting objectives of the stakeholders and decision makers, through negotiations to reach a consensus.

This involves seeking "optimal solutions" to multiple criterion optimization problems, whereby changing one decision-making criterion cannot be improved without making the overall performance worse off with respect to at least one other resource management criterion.)



Outcome of the round table discussions on the first Stakeholder Event

Magnus Ljung &
Nadarajah Sriskandarajah
Swedish University of Agricultural
Sciences

Purpose of the Stakeholder Event

There were three main purposes of the first Stakeholder Event. First of all we wanted to give a diversity of stakeholders the possibility to give their views on and input to the OrAqua-project: What was important for them and what should the project keep in mind during the research process? Secondly, we wanted to present the OrAqua-project and especially the ongoing review process of scientific studies and the state-of-the-art knowledge on organic aquaculture to a cross section of stakeholders. The third purpose was to start a dialogue, including a discussion, on how the stakeholders themselves wanted to get involved continuously throughout the project.

The guiding principles when organizing and facilitating the event were to a) support and guide learning processes among stakeholders to ensure a high level of participation, b) reach

a high quality of deliberations, and by doing this enable convergence of different areas of knowledge, c) get feedback from the participants to the OrAqua review process as well as input for the forthcoming MCDA, and d) document the different inputs made by the participant so that this material could be used by the OrAqua-project. In terms of process design, these principles resulted in a program which was a mix of presentations and small group and plenary discussions.

Program and participants

In short, the program was divided into four distinct but overlapping phases: 1) Opening phase when OrAqua-project was presented placing it into the context of organic farming principles on aquaculture as well as today's challenges identified by stakeholders. 2) The next phase focused on the synthesis of the scientific review process, ending in round table discussions among the participants. 3) The third phase started on day 2 with dialogues in a café format which were self-organized based on the issues that the participants themselves had raised the day before. 4) The last part of the



The platform meeting took place at the Yeditepe University in Istanbul.
Photo: Marie-Louise Andersen

program elaborated issues related to stakeholder participation and outreach of the OrAqua-project.

There were 50 stakeholder participants and 26 OrAqua partners taking part in the Event, a total of 76 participants, closer to our goal of 80 participants at the Event. The participants represented most perspectives, from

Aquaculture businesses to Organic Associations and NGOs, as well as different production systems within the aquaculture sector. Comments were made at the Event that the retailer and consumer interests were not represented at the event. These are stakeholder groups which often are hard to involve, and we will keep this in mind for future activities.

Outcome Round Table discussions

The round table discussions focused on eight themes and for each theme specific and critical issues had been formulated by the OrAqua team in advance.

The themes were:

1. Sourcing of juveniles
2. Feed and nutrition
3. Health – veterinary treatments
4. Stocking density
5. Welfare
6. Environmental interactions, incl. RAS
7. Consumer perceptions and economics
8. Institutional frameworks

Participants were divided into eight groups, each beginning at a table where a specific theme was to be discussed. On completion of this in the allotted time, each group moved to a new table, and then to a third table to complete this activity. The results of the discussions were documented in recording templates. The outcome of the discussions and the main messages, on all eight themes, were presented and discussed at a plenary session in the late afternoon.

After the event the recordings were compiled and the outcome discussed within the OrAqua project. A summary of the presentations and the plenary discussion is available in one of OrAqua's deliverables (D4.1, pp 21-27).

It is not possible to go into all details here, but some important messages and suggestions of measures received from the stakeholders were;

Sourcing of juveniles

- | | | |
|--|---|--|
| <ol style="list-style-type: none"> 1. Organic rules for new species are not perceived as realistic, especially for marine species in need of organic live feed. 2. It is difficult to separate organic and conventional in RAS hatcheries. 3. A separate breeding program for organic juveniles with genetic selection would cost extra, which is almost impossible to make profitable at the current scale of organic aquacul- | <ol style="list-style-type: none"> 4. The main difference in quality of fish from organic and conventional fry are ethical, the use of chemical treatments, different food and production systems, but the nutritional value and product quality will be the same. 5. To reach the goal that 100% of the juveniles should be organic in the beginning of 2016 is perceived as unrealistic, especially for | <ol style="list-style-type: none"> 6. When the market for organic aquaculture grows, some of the problems of sourcing of juveniles will also be solved, it is partly a problem of scale today. 7. There are big differences between species, which is why different species must be handled separately, for instance, by including transition periods. |
|--|---|--|



Trade fair for Organic Food in 2011, BIOFACH Nürnberg. Photo: Marilo Lopez Belluga, Culmarex.

Feed and nutrition

- | | | |
|--|--|--|
| 1. Permission to use trimmings from conventional fisheries should be extended beyond 31.12.2014. | 4. No limits of types of raw material. | 6. A need to remove barriers regarding use of different feed materials (plant), insects, worms, mussels in organic feed. |
| 2. Allow 5% non-organic compounds to critical life stages. | 5. The new regulations might kill organic carnivorous aquaculture, due to limitations in sourcing of ingredients for feed. | |
| 3. Fish Meal from whole fish | | |

Health – veterinary treatments

- | | | |
|---|--|--|
| 1. Anesthetic treatment shall not be included in allopathic treatment limitation. | regulation: A) The substances of preference should be considered as feed raw material or additives, and B) due to a limited market, aquatic animals should have an easier procedure of authorization of relevant substances according to the new regulation on VMPs. | 3. Herbal medicine may play a significant role as immune-stimulants and as a treatment tool in future organic aquaculture. |
| 2. There is a conflict between the Veterinary Medicine Products and current and planned future VMP regulation and the organic | | |

Stocking density

- | | | |
|---|---|---|
| 1. Different perspectives exist among stakeholders, where by some argued for no differences in stocking density between organic and conventional aquaculture, while others argued that it is part of other organic productions systems and relevant in combination with other parameters. | 2. Stocking density is not the main factor for fish wellbeing, therefore it should be considered in combination with other parameters of water quality and husbandry practices. | 4. Account has to be made to the behavioral needs of fish in the wild when discussing stocking density. |
| | 3. At the same time, stocking density still influences fish welfare, therefore some limits are necessary to be set. | |

Welfare

- | | |
|---|--|
| 1. Specific requirements exist for the different species. | 5. We shall not mimic nature, because it might not be the best for the fish. |
| 2. Welfare parameters don't necessarily be connected to organic . | 6. One issue is how to measure welfare parameters. |
| 3. Optimal feed is crucial for welfare considerations, one reason being that feed which is not formulated correct might lead to change in behavior. | 7. Regulation should be according to group of species. They can be produced in different ways. |
| 4. Handling of fish is also important, for instance during transport. | |



A referent within each theme collected and in the end presented the outcome.
Photo: Marie-Louise Andersen

Environmental interactions, incl. RAS

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. In the 3 groups participating in the round table, close to 50% pro and 50% con views existed in relation to RAS being seen as a tool to produce organic fish. 2. What is the definition of “a closed RAS” and what is the renewal rate of a ‘closed’ system (not acceptable for organic label) compared to an open one (accepted)? 3. The main reason why RAS were not accepted as | <ol style="list-style-type: none"> an ‘organic’ system are the high level of technology (very complicated system with a lot of tubes and treatment systems...), which makes it appear like a non “natural” system. 4. In the current regulation for organic products, the rules are not entirely homogeneous with some very detailed information besides the very general concerns. |
|---|---|

Consumer perceptions and economics

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. A cultural effect should be taken into account when considering the EU leaf logo. The EU logo does not carry a specific sense of origin for the products that carry it. 2. Transparency, proactive communication and the provision of key information that make sense to consumers may improve the efficiency of the EU leaf logo. 3. Co-branding the EU leaf logo with national labels that certify organic products will assist in increasing awareness, trust and so on. 4. Consumers are confused about what is organic. One measure should be to develop the commu- | <ol style="list-style-type: none"> nication about organic food in general so that differentiating between agriculture and aquaculture it is better coordinated. 5. Organic aquaculture faces challenges to reach the demands based on the main organic principles. Therefore, organic certified aquaculture products are likely ‘less organic’ than agriculture products. This may lead to the confusion regarding organic seafood and could put the image of organic food production in general at some risk of losing the strong connection to the main organic principles |
|--|--|

Institutional frameworks

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Specific rules for hatcheries and juveniles 2. More technical, species-specific rules 3. Allow parallel production (a member state issue) 4. Support policies for organic aquaculture to reach ‘critical mass’ (conversion, maintenance | <ol style="list-style-type: none"> investments; certification costs, promotion and marketing) 5. More information and education for the consumers 6. The revision of the rules should define and communicate what is organic aquaculture |
|---|---|

Evaluating the Round Table Discussion

Our evaluation of the organization, facilitation and participation of the first event indicated that the participants were in general satisfied with the design of the event and the general level of stakeholder participation. Improvements are possible in areas such as access to materials beforehand, event logistics, quality of facilities, and the use of a broader variety of facilitation techniques.

The diversity of stakeholders (perspectives, pre-understanding, engagement, etc.) made it hard to satisfy all individual needs. Nevertheless, the expressed interest in continuing the dialogue with OrAqua and the willingness to contribute to it shows that the participants valued the OrAqua-initiative high and that the event enabled a need among stakeholders to have both voice and influence on the future of organic aquaculture.

We believe that the first Stakeholder Event fulfilled its purposes and also that it has strengthened the stakeholder platform in OrAqua. Our view is that this first step has created a good platform for future dialogues. The aspects that need to be changed will be taken into account in the planning process of the coming Stakeholder events.

Outcome of the thematic discussion groups

Magnus Ljung &
Nadarajah Sriskandarajah
Swedish University of Agricultural
Sciences

Relevant themes for discussion

On the second day of the Stakeholder event we worked with self-organized stakeholder groups (in the so called café-format). The participants had at the end of the first day answered a feedback sheet. A question they responded to was: "What is an important issue that has not been addressed well so far and need to be considered tomorrow?" Based on the answers we identified seven themes. These were presented in the morning on the second day. The seven headings were;

A. regulations, B. production issues, C. economics of organic aquaculture, D. consumer perspective, E. scale, F. review of organic aquaculture and its progress from a critical perspective, and a theme broadly labeled G) wider social and societal questions.

In the following we mention some examples of what the participants suggested for the work on Day 2. The issue of regulations was for instance about existing conflicts with other existing regulations, consequences of the regulation on health, the environment or products, and the need for species and site specific regulations. Production issues were about, among other things, nutritional questions

and feeding of trimmings, permitted veterinary treatments, and the differences in welfare of fish and shrimps. When it comes to the economics of organic aquaculture this was related to the need for a better understanding of markets and the present status of the business sector of organic aquaculture.

The theme consumer perspectives raised a critical perspective by asking the question "do we know what we are talking about?", or in other words the need for more studies on consumer perspectives. The issue of scale was about clarifying the relationship between farm, region and landscape level, for instance, when it comes to impact. There were also an expressed need to review organic aquaculture and its progress from a critical perspective. This was for instance about the wider benefits of organic aquaculture for society at large, and which the future directions will be. Finally, there were some issues that focused on wider social and societal questions in relation to organic aquaculture. One aspect was which lessons that had been made in agriculture and what we can learn from it, and another about the challenge of feeding

the world through organic aquaculture.

When presenting the above themes, we also posed the question to the participants if this covered their interests or if the list of themes should be complemented with others themes. Based on the headings and a short description of what was meant, the participants then self-organized themselves into smaller discussion groups. Two overall questions were to be discussed in each group:

A. What needs to happen to develop the organic aquaculture sector?
B. What is important for the OrAqua-project to keep in mind over the next two years?

Outcome of the group discussions

In the process of self-organizing some groups were split, leading to 11 working groups being formed. Each group reported their discussions by making three clear statements on a flip chart. What was presented on the flipcharts is summarized on the next page, along with how the different groups labeled themselves when finding a shared focus.



Trade fair for Organic Food in 2011, BIOFACH Nürnberg. Photo: Marilo Lopez Belluga, Culmarex.

JUVENILES

1. Subsidising of organic hatcheries of juvenile producers/farmers during a transition period
2. Species based differentiation – if organic juveniles, if available then requested
3. To OrAqua: Monitor development trends in availability of organic juveniles during 2 year
4. Working group of stakeholders/project partners across species

WELFARE

1. Definitions...
 - Species specific
 - Shared
 - Indicators
2. Carrying capacity looks better than stocking density
3. Regulations needs room for innovation and “out of the box”-thinking

SOCIETAL QUESTIONS

1. Aquaculture is not a niche market. It has an increasing importance in feeding the world.
2. Aquaculture regulations should better reflect the principles of organic agriculture, to empower producers of all sizes.
3. To develop the sector, we need to change attitudes of all value chain actors (including consumers) to support the economic viability of aquaculture producers.

EU – NON EU

1. Due recognition has to be paid to the very important role of value of small-scale production systems (smallholder farming/family farms) world-wide
2. This is not presently the case; rather regulations/imports favor large scale, global industries
3. This is important for global food security

FEED

1. Raw material
 - Remove barriers regarding different feed material (plant)
 - Prioritize marine ingredients
 - Trimmings
 - Aquaculture organic / conventional?
2. Additives
 - Vitamins
 - Specific nutrients
 - Pigmentation, etc.
3. Important to monitor!

UNDERSTANDING MARKETS

1. Lack of data on production and markets database
2. High competition in global seafood sourcing keep the regulation feasible
3. Market trends impact on organic aquaculture (e.g. regional products)

VETERINARY TREATMENTS

1. Anesthetic treatment shall be out of allopathic treatment limitation
2. There is a conflict between the VMP (Veterinary Medicine Products) actual and future regulation and the organic regulation:
 - When possible the substances of preference (art 25t a-b-c) shall be considered as feed raw material or additives
 - To find an easier way to authorize, when point not possible those substances according to the new VMP regulation (limited market)
3. Reconsider the setting of withdrawal period according to the VMP regulation

CONSUMER GROUP

1. Developing aquaculture further
2. Respond to differential consumer concerns in different countries, in particular among organic consumers, by informing them about aquaculture practices, and by taking their concerns truly seriously.
3. Recommendations for OrAqua
4. Map consumer preferences in greater depth, differentiating between countries, organic and non-organic consumers and subgroups, using quantitative as well as qualitative survey methods (participatory action research?)
5. OrAqua should contribute to identifying the bottlenecks to better availability, visibility and access to organic fish for consumers

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Organic aquaculture: From implementation of the first rules to the newest regulation

Giuseppe Lembo
COISPA Tecnologia & Ricerca

Since the introduction of the implementing rules on organic aquaculture into the Reg. 889/08, the organic market has continued to have a dynamic development. However, neither internal supply nor the legislative framework has kept up with the evolving of the consumer and citizen concerns and expectations. In addition, the legislation has shown elements of complexity along with unresolved issues, which are stopping farmers from joining the Union's organic aquaculture scheme.

Some of the most controversial matters have been addressed by the Expert Group for Technical Advice on Organic Production (EGTOP), which delivered a first report (Part A) on December 2013 and a second report (Part B) on July 2014 (http://ec.europa.eu/agriculture/organic/eu-policy/expert-advice/documents/final-reports/index_en.htm). Furthermore, several amending regulations 889/08 have been approved, in the last three years, on the organic aquaculture and a new proposal for a Regulation of the European Parliament on organic production and labelling of organic products was put forward on March 2014, but is still under discussion.

An overview of the main conclusions of the EGTOP reports is shown next.



The Culmárex group manages a organic hatchery and several marine farms along the spanish coastal line. Photo: Culmarex

The lack of organic juveniles

The lack of organic juveniles has been reported by a number of Member State delegations at the Regulatory Committee on Organic Production. The EGTOP report (Part A) evidenced that, although there are no official data on the number of certified organic hatcheries in Europe, there is information on a few hatcheries (e.g. a trout hatchery in Denmark) that have recently converted or are in the process of conversion to organic production. However, it is reasonable to assume that the present production of organic juveniles is inadequate to supply the development of the aquaculture industry certified according to European Regulation. The main difficulties experienced by the sector,

evidenced in the EGTOP report were:

1. The Directive 2006/88/EC on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals. This Directive established five categories of health status in which countries, zones and compartments have to be classified, and rules to be followed for introducing or dispatching animals among areas with different health status classification.
2. A second barrier to the movements of seed or juveniles among farms is due to the reluctance of farmers to introduce on their farms animals which could be unsuitable for the local (geographical) environment (e.g. genetic or population traits, resistance to different diseases, growth performances, reproductive cycle, behavioural characteristics, etc.).

Then the EGTOP conclusion was in favour of the use of non-organic juveniles, for on-growing purposes, subject to the restrictions/recommendations: shown on the *next page*.

A. Organic juveniles should be used when available;
B. At least the latter two thirds of the duration of the production cycle shall be managed under organic management (Article 25(e)(2) of Commission Regulation (EC) No 889/2008). The need to create a database on the availability of organic juveniles produced in each country, as for the Seed database (ref. Article 48 of Commission Regulation (EC) No 889/2008), was also expressed in the report.

Dietary requirements of carnivorous fish

A number of Member State delegations at the Regulatory Committee on Organic Production have questioned the requirement in Article 25k of the Reg. EC 889/2008 and requested that this be reviewed in order to allow an appropriate composition of proteins and lipids in the fish feed.

The EGTOP report (Part A) pointed out that fish should cover their needs for amino acids and fatty acids primarily through the natural compounds of the feed. In order to comply with the general rules on feed (cfr. Article 25(j) of Reg. EC 889/2008), namely: "... optimum performance, animal health, high product quality, including the nutritional composition which shall ensure high quality of the final edible product and low environmental impact", the diet for carnivorous fish should be characterized by a well-balanced proportion of amino acids, fatty acids and lipids.

In the report was also expressed concern about the



Through 25 years the Culmarex group have been growing and marketing organic whitefish (Seabream and Seabass).
Photo: Culmarex

consequences of the listed priorities of sourcing feed as laid down in Council Regulation (EC) No 889/2008 Article 25(k). Indeed, with respect to fish meal derived only from trimmings, the risk is that the levels of phosphorus contained in such fish meal might result in conflicts with national environmental legislation.

In the EGTOP conclusions the following alternative options were suggested, in order of priority:

1. Besides fish meal and fish oil derived from trimmings of fish, crustaceans and molluscs, also fish meal and fish oil derived from "whole fish not used for human consumption", caught in sustainable fisheries, should be allowed as ingredients in feed for organic carnivorous fish. This includes feed for fry and brood-stock, as well as for on-growing fish,

until sufficient alternative sources of protein and oil are available.

2. The use of other alternative feed materials consisting of whole micro or macro organisms with high content of essential amino acids and lipids, where possible produced organically, may be needed and are to be preferred to the use of purified or free amino acids as feed supplements/additives.

3. If not available from organic procedures, essential amino acids and lipids obtained by fermentation or other similar procedures should be allowed as ingredients/additives in carnivorous fish feed only if specifically authorised.

Closed recirculation systems

One Member State delegation at the Regulatory Committee on Organic Production proposes that EGTOP evaluate the pros and cons of closed recirculation systems in relation to the organic regulation.

In the EGTOP report (Part B) was evidenced that according to Article 2j of Reg. EC 889/2008 a "closed recirculation aquaculture facility" is defined as "a facility where aquaculture takes place within an enclosed environment on land or on a vessel involving the recirculation of water, and depending on permanent external energy input to stabilize the environment for the aquaculture animals".

Continued next page

In a closed recirculation aquaculture system (RAS) new water is mainly supplied for filling up and to replace water lost by evaporation. The degree of recirculation can be of about 95 % of the volume.

Intensive Recirculation Aquaculture Systems (RAS) are used in conventional aquaculture production to minimize water consumption, as well as the environmental impact of the water discharge. RAS can use the same water many times and hence includes a wide range of waste water treatment devices. As a matter of fact, the use of RAS disconnects the production from the external environment.

In the table to the right the EGTOP report (Part B) reported a schematic comparison between a traditional flow through system in organic farming and an intensive recirculation aquaculture system (RAS) in conventional aquaculture.

The conclusion of the EGTOP report highlighted that closed recirculation systems (RAS) have several environmental advantages, but require significant input of external energy, high stocking densities (for economic reasons), advanced waste water treatment devices, use of UV radiation and use of pure oxygen. All the above, together with the disconnection of the aquaculture production from the external natural aquatic environment, makes the closed recirculation systems (RAS) not in line with the principles of organic production. However, an alternative strategy could be the re-use of water which,

Flow-through organic system	RAS
Advantages <ul style="list-style-type: none"> • Production in common with nature • Favours biological diversity and animal welfare • Natural temperature and light conditions • Lower stocking density • Behavioural needs can be met • Renewable energy use, e.g. for aerators • Environmentally sustainable 	Advantages <ul style="list-style-type: none"> • Low water consumption • Recycling of water • Stable farming conditions/water quality • Control of water temperature • No environmental impact • Prevents ingress of pathogens • Prevents escapes • Recycling/collection of waste nutrients (fertilizer) • Easy to disinfect/clean
Disadvantages <ul style="list-style-type: none"> • Dependent on external conditions (weather, temperature fluctuations, water quality) • Risk of escape • Risk of ingress of pathogens 	Disadvantages <ul style="list-style-type: none"> • Energy consuming • Use of pure oxygen • Higher stocking density • In case of disease, risk of boosting prevalence

to some extent, combines the advantages of both flow through systems and RAS, without compromising organic principles. Re-use of water means a kind of extensive recirculation in out-door systems with up to 70 % of reuse of the water. Instead of being discharged, the water is pumped back to the inlet and re-used in the fishponds, tanks or raceways after passing waste water treatment devices such as natural-filter beds, settlement ponds, mechanical or biological filters to collect waste nutrients, and/or using seaweeds and/or bivalves and algae, which

contribute to improving the quality of the effluent.

To comply with the species-specific physiological requirements of the fish, the proper oxygen saturation in the aquatic environment shall be achieved only by using mechanical aerators. This means that there should be a well-balanced equilibrium between the stocking density, the efficiency of the waste water nutrients removal and the amount of water re-used for the proper operation of the organic farm. *Continued next page*

Eyestalk ablation in shrimps

One Member State delegation at the Regulatory Committee on Organic Production pointed out the need for harmonization of the interpretation of the prohibition of eyestalk ablation for reproduction in shrimp. It was also requested a clarification of the term ablation in relation to hatchery practices such as ligation, incision, pinching etc. Such matters were addressed in the EGTOP report (Part B).

The reluctance of most shrimp to routinely develop mature ovaries in captivity is a function of elevated levels of GIH, and eyestalk ablation lowers the high haemolymph titer of GIH. However, the effect of eyestalk ablation is not on a single hormone such as GIH, but rather affects several physiological processes.

Without ablation, shrimp hatcheries would have to rely on natural breeding. This is slow and unpredictable, especially for species like *Penaeus monodon*, therefore it would lead to shortages of the small shrimp needed to stock ponds. The aim of ablation, under these circumstances, is to stimulate the female shrimp to develop mature ovaries and spawn. Even in conditions where a given species will develop ovaries and spawn in captivity, use of eyestalk ablation may increase total egg production and increases the percentage of females in a given population that will participate in reproduction.

There are four main techniques used for eyestalk



Eggs counter from organic fish production.
Photo: ICROFS project RobustFish

ablation: pinching, enucleation/slitting, cauterisation and ligation. Pinching is the most common technique used for ablation. One eyestalk is pinched between the thumb and index finger and squeezed. This destroys one of the glands producing the hormone that prevents breeding. Enucleation is the method of slitting one eye with a razor blade, then crushing the eyestalk, with thumb and index fingernail, beginning one-half to two-thirds down the eyestalk and moving distally until the contents of eyes have been removed. Cauterisation uses either an electro cautery device or an instrument such as a red-hot wire or forceps that are applied to the base of the eyestalk. This is a relatively low-stress method as the wound is sealed quickly after the ablation. Ligation means tying off the eyestalk tightly with surgical or other thread. This method

also has the advantage of immediate wound closure. The thread is then tightened to limit the blood supply to the eyestalk. After ligation, the eyestalk falls off after a couple of days.

The EGTOP conclusions were that without eyestalk ablation, production of juveniles is unpredictable and does not allow a guaranteed production cycle.

The alternative of collecting breeders in the wild, in absence of a well-documented management plan, is not desirable. Nevertheless, organic principles and consumer expectations are that organic animal husbandry avoids mutilations in all animals. Therefore, for the sake of integrity of organic production, this fundamental principle should be uniformly applied for all animals. However, in case of derogation of such principle, the technique of ligation would be more acceptable than pinching, enucleation/slitting, cauterisation or other methods.

Most of the conclusions put forward by EGTOP are now included in the above mentioned amendment regulations. But the most important change, in terms of methodology, is contained in the new proposal for a Regulation of the European Parliament on organic production and labelling of organic products. This proposal is still under discussion and a more advanced draft of the proposal has been delivered to the Working Party on Foodstuff Quality (Organic Farming), under the aegis of the Latvian Presidency of the Council of the EU.

Events

Upcoming

Next OrAqua partner meeting

To prepare the next stakeholder meeting the partners will meet in Vodnany, Czech Republic, in March.

Stakeholder platform meeting

Will take place back to back with the European Aquaculture Society meeting in Rotterdam, Netherlands, on 20-23 October, 2015.

Read the supplement:

Recommendations and research gaps identified from the first stakeholder meeting in Istanbul.

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Turbot is one of the species farmed organic.

Photo: Wout Abbink, Institute for Marine Resources & Ecosystem Studies, Wageningen University



Recommendations and research gaps

Based on the analysis of the preliminary information provided by the literature review and feed-back from the 1st Stakeholder event in Istanbul 11th -12th October 2014 the following issues were considered as important to underpin the future growth of the European aquaculture sector:

Nutrition

- Sourcing of feed ingredients for organic aquaculture needs to be re-considered and supported by experimental data, in order to secure compliance with the organic principles of fish welfare and environmental sustainability,
- Until more knowledge is available, fish meal and fish oil derived from industrial fish caught from sustainable fisheries (not used for human consumption), might be allowed as ingredients in feed for organic fish, until suffi-

cient alternative sources of protein and oil are available,

- The use of fish meal and phospholipids in shrimp diets needs to be re-considered,
- The use of other alternative feed ingredients providing high content of essential amino acids and lipids, when possibly produced organically, might be used in priority

to purified or free amino acids as feed supplements/additives,

- If not available from organic procedures, essential amino acids and lipids obtained by fermentation or other similar procedures might be considered as ingredients in feed for organic aquaculture,



Procedures in compliance with organic rules for removal of anti-nutrients in plant sources need to be addressed according to the stakeholders.
Press photo: Dansk Akvakultur

- Studies have indicated that not only the overall dietary amino acid profile is important for efficient utilization of amino acids, but also the timing by which amino acids from different protein sources appear in the blood stream after a meal. A significantly higher amount of indigestible carbohydrates have been measured in a diet based on vegetables than in a fish meal based diet, which suggested that the uptake of amino acids was affected by dietary carbohydrates. This issue also needs attention when considering ingredients in feed for organic aquaculture.
- Procedures in compliance with organic rules for removal of anti-nutrients in plant sources need to be addressed.
- Development of relevant organic plant sources to optimise the amino acid profile by mixing the protein sources and hence produce an opti-

mum balanced diet for organic fish needs to be considered.

- It is important to keep focus on human health related to eating (organic) aquaculture products, including high content of omega-3 fatty acids (HUFAs) currently sourced from fish oil.
- Regulation on request of exchanging fish oil by vegetable oils in accordance to development of vegetable or other sources producing omega-3 fatty acids (HUFAs) has to be adjusted.
- Research in alternative sources of omega-3 fatty acids (HUFAs) should be prioritized.
- Chemically well-defined analogic substances to minerals and vitamins may be considered as ingredients in feeds for organic aquaculture when natural substances are unavailable.

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Organic juveniles

- Except for already available organic trout, it seems difficult to fulfil the request of 100 % organic juveniles from 1st January 2016, in particular for marine species like sole, turbot, sea bream and sea bass due to the current non availability of organic live feed for larvae.
- Specific organic rules are needed for managing the life cycle stages between hatching and weaning of juveniles for specific species in fresh water and for marine species.
- The current regulation does not distinguish between organic and non-organic hatcheries including phyto- and zooplankton and larval rearing systems.
- An option might be to start organic rules from fry stage weaned using dry feed.
- Due to limited availability of organic feed ingredients, concern is raised about the quality of dry feed in terms of providing essential nutrients.

- If available, domesticated broodstock, preferably selected for relevant robust strains (survival, disease resistance and growth), should be used in breeding for organic seed.
- Need of defining breeding objectives and implementing cost effective breeding strategies that control inbreeding rate at a sufficient low level (<0.5% per generation), to secure adequate genetic material specifically for organic aquaculture.

Recirculation Aquaculture Systems (RAS) – Environmental interactions

- RAS allows to produce with minimal environmental impact: low water usage, prevention of escapes and ingress of pathogens, biosecurity, recycling of water and collection of waste,
- In most situations, similar energy use in RAS versus flow through systems,
- The main reason for restricting the use of RAS to organic juvenile production



The significance of light regimes requirements on the welfare and performance in organic aquaculture is one of the issues stakeholders mentions. Press photo: Dansk Akvakultur.

seems to be more based on consumer perceptions of RAS as a “high-tech-non-natural” system than on scientific information,

- From producer’s point of view, the hatchery should be disconnected from the on-growing phase as for several species it is not economically realistic to produce juveniles in open systems.
- There is a need for more knowledge on fish welfare in RAS,
- Further knowledge is need-

ed about RAS and IMTA and the potential use of these concepts in organic aquaculture.

Welfare

- Data on optimal stocking densities are conflicting: more studies are needed about the relation between stocking density and water quality and a multitude of operational behavioural, physiological and morphological welfare indicators,
- The potential benefits of providing fish with access to

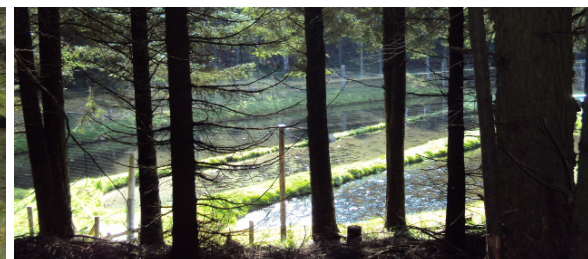
nature-like substrates are species specific. Current knowledge suggests e.g. salmonids and maybe other species (e.g. wrasse) may not have a preference for substrate per se, but a preference for shelter that could be overhead, floating or benthic.

- More knowledge is needed on the significance of light regimes requirements on the welfare and performance in organic aquaculture.

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Photo: Colourbox



According to stakeholders, the most humane stunning methods is percussive and electric stunning, followed by killing with gill cut. Press photos

Health – Veterinary treatments - Biosecurity

- Anesthetic treatment should not be included in allopathic treatment limitation,
- There is a conflict between the current and future regulation on VMPs (all kind of Veterinary Medicine Products) and the organic regulation as (1) the substances of preference (article 25t a-b-c) should be considered as feed raw material or additives and (2) a more adequate procedure of authorization of relevant substances according to the new VMP regulation might be considered in relation to organic aquaculture.
- The setting of withdrawal period according to the VMP regulation (if a withdrawal period is not defined for a species or a product you can

multiply by 1.5 the withdrawal period for a similar product registered for another species) has to be reconsidered.

- Herbal medicine should be further investigated as it may play a significant role as immune-stimulant and as treatment tool in future organic aquaculture.

Transport

- Excessive changes in water temperature and pH during transportation must be avoided,
- Smolt densities of up to 70 kg/m³ by road transport for up to 90 minutes did not compromise fish welfare,
- In open-hold well boat transport, densities of up to 150 kg/m³ for more than 10 hours had no significant effect upon salmon welfare,

- Maximum density for transportation of fry might be set to 10 kg/m³,

- The loading phase appears to be more detrimental to welfare than the transport phase and well boat transports seemed to have an important recovery function,
- The effects of eugenol on large scale transport of smolts need further investigation,
- The potential welfare costs/benefits of large scale live chilling during transport need to be investigated in greater detail for adult fish.

Killing – Slaughtering

- When properly done the most humane stunning methods is percussive and electric stunning, followed by killing with gill cut.
- Throughout storage prior to

slaughter water quality should be monitored and continuously adjusted according to the fish demand,

- Adequate pump equipment should be used with care and only trained staff should manage such equipment,
- Personnel in slaughtering should be regularly (annually) trained regarding fish welfare and equipment,
- More investigations are needed to evaluate alternative stunning methods regarding humane slaughter (e.g. CO₂, alternative anaesthetics),
- The use of electric stunning is considered as humane, but today the method is complicated and neither used friendly nor easily applied commercially,
- Alternatives to waiting cages should be investigated.

Escapee

- Species-specific distinctions might be made between escapes of fish and escapes of viable gametes,
- Efforts should be put on prevention of escapees (putting requirements for the physical design of the installation of net cages and for operating and maintenance requirements),
- Specifications should be put on robust netting materials to resist tearing or biting,
- Curtain-like egg collectors might be used to mitigate egg escapee in cages with potential spawners (Atlantic cod and gilthead seabream). The commercial efficacy needs to be tested.

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Energy consumption – CO₂ – Life Cycle Analysis (LCA)

- Need of defining criteria and reference points for an environmental sustainable food production.
- Need of more research on LCA methods to evaluate properly environmental impact and carbon foot print.

Recycling and waste

- Need of more knowledge and technology for recycling of nutrients from aquaculture
- Need of more investigations of solutions for collection, de-watering and re-use of

waste from aquaculture production.

Sea bottom

- Environmental impact and interactions in relation to cage farming and the sea bottom needs consideration,
- Ecological impact of cage farming and wild fish attracting device needs consideration.

Consumer's perception

- The consumer's perception of ECO, organic, fair-trade and sustainable is vague due to lack of knowledge and

linguistic confusion among languages in EU,

- Consumers are confused about what is organic, and hence information about organic food should be significantly focused.
- An efficient communication strategy is urgently needed.
- A cultural effect should be taken into account as national labels carry an image of local control, which may be important for a developing organic aquaculture sector.
- Transparency, proactive communication and the provision of key information

that make sense to consumers may improve the efficiency of the EU leaf logo and the purchase of organic aquaculture products. It should be clearly communicated on what organic aquaculture is.

Institutional frameworks

- Too complex and fragmented management regimes seem to be the most important issue of the institutional frameworks, which is aiming at harmonizing the production rules for organic aquaculture in EU,
- Uncertainty of the rules

and on exception deadlines creates a lack of trust and investments.

- The rules are not based on sufficient scientific and practical knowledge and need to be differentiated according to different species/groups,
- Support policies are needed in this initial phase for the organic aquaculture sector to reach 'critical mass'.

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Press photo: Dansk Akvakultur

Ethics

The ethical analysis and evaluation revealed a range of potential conflicting interests and needs related to the current framework for organic aquaculture.

The following dilemmas and issues need further attention and clarification, when considering future regulation of organic aquaculture.

The classical dilemma in organic standard setting is visible also in Organic Aquaculture: Should we increase differences to conventional by stricter standards, taking the risk of losing farmers/producers, or should we keep differences at a lower level, not necessarily minimum, but closer to conventional, in order to increase the number of certified producers, but at the risk of losing consumers who dislike the 'weak' standards?

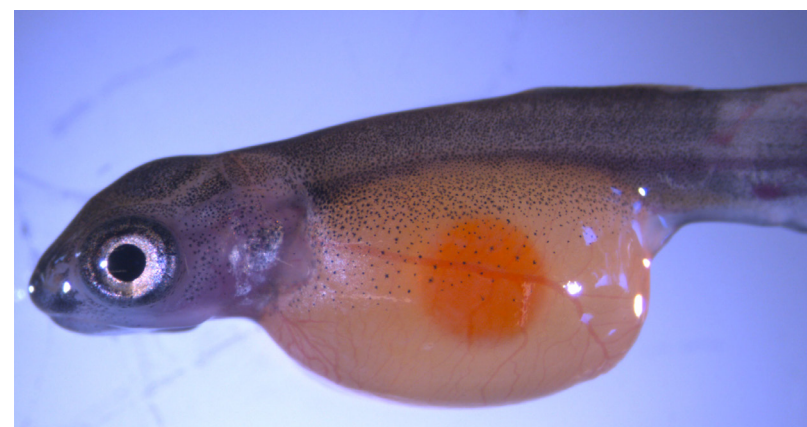
The critical point is to identify the break even with regard

to the levels of the three parameters: the standards, the engaged producers and the consumer trust, which includes:

- How to gain consumer trust in organic aquaculture if the differences to conventional systems are low? What to inform consumers about it there are few differences?
- How to ensure increase in organic aquaculture if large differences to conventional leads to few producers being interested?
- How to keep or create an interest among those organic producers who strive for a substantial difference and contribution?
- Fish welfare needs to be defined in relation to each species, and welfare indicators are needed,
- Stocking density includes several interconnected rearing parameters (water quality), which address welfare as well as other ethical issues,
- Impact of stocking density

on fish welfare is difficult to measure, and opens for a range of ethical considerations,

- The definition of 'unnecessary suffering' as related to rearing systems, consumer perceptions and regulations (Organic, EU Slaughter directive as well as Treaty of Lisbon) needs further clarification,
- Stunning followed by slaughtering can be performed without causing (much) stress and pain, but legislation still allows methods that do (CO₂). This needs to be addressed in the organic regulations.
- Regarding farming of species fed on animal protein, is this the best possible use of global resources? Are arguments in favour of feeding cattle soy proteins that humans could eat instead and feeding carnivorous fish meal convincing? If yes, are they so strong that it also justifies the suffering and stress we cause individual animals? Is there a



Fish breed. Photo: from the ICROFS project OptiFish.

morally/ethic relevant difference between cows and fish? Are fish less worthy of ethical consideration than other animals? If not, what is the alternative? What is the ideal organic system? Cattle eating mainly grass we can't eat, mono-gastric animals (pigs) mainly eating our waste and fish fed mainly on alternative protein sources? If so, what is the role of organic regulations in promoting such a shift?

A main aim for the revision is to strengthen and harmonize the rules of production and to raise confidence of the

consumers to organic production.

However, EU covers an extensive geographic area, which might impose climatic related challenges for organic production systems in rural areas to fulfil the organic principles.

Another important challenge is that the current regulation is not sufficiently specific and hence allows different interpretations in different countries, i.e. different conditions of control and anti-competitiveness between the countries.