

European Percid Fish Culture (EPFC)

EAS thematic group on the culture of pike-perch, perch and other species of the family percidae for human consumption, stocking and conservation.

Dear Friends and Colleagues,

Dear EAS Members,

Dear PERCID-fish aquaculture insiders and stakeholders,

In this newsletter:

- [Summary of the 1st EPFC workshop](#)
 - I. [REPRODUCTION & DOMESTICATION](#)
 - II. [HATCHERY](#)
 - III. [ON-GROWING & NUTRITION](#)
 - IV. [MARKETING](#)
 - V. [TRAINING & KNOWLEDGE MANAGEMENT](#)
- [What's next, EPFC?](#)
- [EPFC meeting at EUROTIER, Hannover, Germany](#)

Summary of the 1st EPFC workshop

The 1st European Percid Fish Culture (EPFC) thematic group workshop was held on September 1st in Prague during the AQUA2012 conference. The workshop attracted 80 participants from all over Europe and overseas. Not surprisingly, the majority of participants (49) had a fundamental or applied research background, but still more than a third (31) of the people were either fish producers or working in the adjacent industry. [The full list of participants can be downloaded here.](#)

Here is a short summary of the activities during the workshop:

The workshop participants were welcomed by the organizers, Stefan Teerlinck (Inagro), Stefan Meyer (GMA) and Tomas Policar (University of South Bohemia) who initiated the EPFC thematic group. The organizers expressed their gratitude for the financial support of the sponsors, Percitech S.A. and all others. More information about EPFC can be found in the 2nd and 3rd section of this newsletter.

In his opening words, **Courtney Hough** (FEAP, EATIP) introduced “**The Future of European Aquaculture**” a recently published policy document outlining the strategic research and innovation agenda for our sector. This document accommodates the input of more than 400 stakeholders and will be introduced to members of the European Parliament in a launching event on October 30th in Brussels. More information on this event can be found here: <http://www.eatip.eu/>

Mr Hough pointed out that the European seafood (protein) market is by more than 70 % reliant on imports. Increased import competitiveness is of pivotal importance for the sustainable development of the aquaculture business sector and for securing the future demand for seafood. Aquaculture in Europe has to provide not only sustainable, but also healthy, affordable and high-quality seafood products to the market. His claim to the workshop participants was to extract as many conclusions and recommendations from the gathered expertise of the people in the room as possible and to use this to steer the direction of future research, innovation and development activities on the national and international level. The workshop organizers underlined this claim and pointed out that this is one of the main reasons for initiating the EPFC.

In his key note presentation, **Thomas Janssens** from the main sponsor Percitech S.A. gave an overview from his practical perspective as a hatchery manager about “**Perch production in Switzerland**”. In Switzerland, perch fillets of small size (10-40 g) are a high-priced national dish, usually referred to as “filets de perche meuniere”. Most of these fillets are imported (90 %) as frozen product from Eastern European countries and only around 10 % of supply stems from Suisse lake fisheries. Percitech started to produce the species some 15 years ago and since 2008 consistently increased production capacities. The main challenges, like husbandry, cannibalism, deformities and bacterial management, are in good control now. The current focus of the companies’ own research and development work is centered on nutritional deficiencies, increased egg supply, breeder selection and growth rates. The hatchery currently produces 12 batches a year and rears 5 g juveniles within 3-4 months before they are moved to the indoor on-growing site at Valperca. This facility uses a 180 l/sec mountain well (from a tunnel construction site) as freshwater supply in combination with RAS technology. Fish are slaughtered at around 135 g body size, yielding ready-to-sell 20 to 30 g fresh fillets within 48 h post slaughter.

Each theme session of the workshop was opened by an expert presentation, giving an overview on the current state in the respective field. The presentations are available for download (see below).

I. REPRODUCTION & DOMESTICATION

II. HATCHERY

III. ON-GROWING & NUTRITION

IV. MARKETING

V. TRAINING & KNOWLEDGE MANAGEMENT

1. REPRODUCTION & DOMESTICATION

Mr **Pascal Fontaine** (UR AFPA) gave an overview on his group's work on "**Reproduction and Domestication in Eurasian perch**" ([download](#)). Recent work includes the development of reliable photoperiod and temperature protocols for the induction of out-of-season spawning. Further work is currently done on the geographic adaptation of different strains/population of origin of perch, broodstock nutrition and breeder characteristics. Even though perch is considered a domesticated species (stage 4, i.e. closed life cycle, no input from the wild), the lack of a trait-based breeding program poses a major sanitary risk. Question from the audience, after the talk, related to patents on out-of-season induction protocols. These should be, to Mr Fontaine's opinion, be held by public authorities and therefore be freely available to all producers.

Mr **Darek Kucharczyk** (UWM) held a talk with the title "**Induced propagation of pikeperch *Sander lucioperca***" ([download](#)). In the beginning of his talk, he shared hands-on experience and recommendations for the hormonal induction of pikeperch spawners, describing the type and timing of injections and identification of maturity status of female ovaries. This was followed by a description of male handling, artificial insemination and subsequent egg incubation practices. Questions were asked on the effect of repeated injection (year-to-year) of female broodstock. There is currently no experience in pikeperch if there is an effect of inducing the same individual several years in a row. The general question if it is absolutely necessary to use hormonal induction at all was falsified from experience of spontaneous spawning under capture-conditions, but it was pointed out that hormones improve the synchronization of spawning activities which in turn facilitates the following hatchery phase (e.g. timing of zooplankton availability in stocking ponds). Furthermore, it was pointed out that there exists hardly any data on the effect of hormonal induction on gamete quality, because the current practice of inducing wild-caught broodstock (and their high sensitivity to captive conditions) did not allow for systematic research on this topic.

The overall **conclusion and recommendations** from this session were:

- Off-season reproduction is highly recommended in both species, especially for stocking of year-round producing RAS systems and even for early stocking of ponds and natural water bodies,
- The effects of off-season induction (natural and by hormonal induction) on egg and larval quality are not sufficiently understood,
- The domestication of both species is currently hampered by the lack of trait-based breeding programs. It is realized that this is a major task which needs to be addressed by a coordinated, science-based approach, which will only be possible in a close cooperation between research and industry. Results from current state-of-the-art breeding programs in other finfish species indicate significant improvements of relevant traits in a relatively short period of time,
- It needs to be realized though that the selection of certain traits, which are favorable under intense RAS conditions, might be counterproductive for pond production and/or stocking programs. More research on this topic, e.g. by identification of trait indicators and common-environment experiments, is needed.

2. HATCHERY

Mr **Tomáš Polícar** (UoSB, FROV) summarized the current state of percid hatchery practices at his institute in his talk "**How to stabilize supply of larvae and juveniles in Eurasian perch and pikeperch**" ([download](#)). He provided details on egg incubation, larval and juvenile culture systems (pond and RAS), multiple production cycles, RAS tank design and conditions, larval nutrition (including probiotics), sorting and fish health. He concluded that the combination of RAS and ponds production, rearing different life stages in either of this system, is a both biologically and economically meaningful way of producing high-quality stocking material. For example, broodstock fish from controlled production (RAS) exhibit a higher handling tolerance (e.g. when hand-stripping) than pond-reared fish.

This notion referred to the previously mentioned adaptation (selection?) of RAS-relevant breeding traits (see above). Questions were asked on larval stocking densities in ponds (150.000/ha perch, 200.000/ha pikeperch), light regimes during larval life feed phase (400 lx), the use of rotifers (first feeding of perch larvae in ponds) and the use of pond-in-pond system for larval rearing (100 larvae per liter).

The overall **conclusion and recommendations** from this session were:

- The hatchery practices (rearing, feeding, weaning, sorting, ...) have been investigated a lot in the last years, both in an academic and an industrial context. The bottom line is that the success (in terms of growth, avoiding cannibalism, malformations, etc.) is mainly a matter of experience of the actual hatchery staff and newbies are referred to existing expertise, e.g. from manuals and reports (mainly from an academic background),
- One bottleneck, irrespective of the previous conclusion, still is the stable supply of high quality fry. Under certain conditions, mass mortalities and/or high frequencies of malformations appear without conclusive cause. It is speculated that this might be related to genetic effects or larval behavior. In any case, this requires further attention and systematic investigation.

3. ON-GROWING & NUTRITION

Mr **Stefan Teerlinck** (INAGRO) gave an overview over "**Bottlenecks in ongrowing of percid fish**" ([download](#)), referring to 1) Supply of fry, 2) Water usage in RAS, 3) Technical obstacles, 4) Water quality management and 5) Choice of fish feed. For fry supply, he pointed out that deficits in quality might be overcome by selection (see above) or by contracted agreements between supplier and customer on certain quality indicators that need to be fulfilled. The use of different quality classes (sorted juvenile size classes) might have a counterproductive effect on growth performance and behavior in the grow-out phase. RAS is apparently the best choice for regions with low water supply, but linking with e.g. green houses is challenging (e.g. 40 ha greenhouse for 1 fish farm), especially in terms of economy. Currently, the direct use of sludge as agriculture fertilizer is more meaningful. He concluded his presentation with some slides on technical obstacles (e.g. means of automated sorting, examples from Ireland) and feeding trials (using commercial diets, floating and sinking) which showed no differences in growth rate.

Mr **Edward Schram** (IMARES) gave a brief glimpse at some of his results on "**Ammonia and nitrate tolerance levels in juvenile pikeperch**" (presentation included in Teerlinck ([download](#))). Whereas SGR was affected at low levels of ammonia (0.05 mg/l NH₃-N), no effects were found for nitrate (up to 300 mg/l NO₃-N).

Ms **Ingrid Lupatsch** (CSAR) introduced a "**Generic approach to quantifying nutritional requirements in aquatic species**" ([download](#)), which would enable the adequate formulation of a species-specific pikeperch or perch-diet. By quantifying maintenance requirements of protein and energy, it would be possible to formulate a diet that would yield an optimal weight gain with a minimum utilization of raw materials. This kind of fundamental work has, in large, not been done for these species.

The overall **conclusion and recommendations** from this session were:

- Sorting of juveniles is of pivotal importance to minimize cannibalism and to achieve optimal growth results, but the losses due to this practice can be severe. This might be tackled both by improvement of sorting techniques and overall improvement of settling quality before beginning of grow-out,
- Selection on visible traits in the grow-out phase (i.e. keeping the biggest fish in the end) might cause a counterproductive selection against other relevant traits, e.g. related to immune-competence and behavior,

- Reduced growth rates during the grow-out phase (500g+) are observed in some producers (mainly RAS) and limit the economically viable production of bigger-sized fish for marketing as fillets (e.g. 2kg+ round weight). The reasons for this are currently not understood and further research is recommended,
- Water-quality characteristics are, not surprisingly, very important for the performance of all life stages. Apparently, life stage specific differences exist in the respective tolerance levels and further attention should be directed to the combined effects of different parameters, e.g. ammonia and CO₂ under RAS conditions,
- The formulation of species-specific diets will require studies on the nutritional requirements of the species. Being carnivorous species, current research on the utilization of alternative (e.g. plant-based) raw materials and supplements are highly encouraging.

4. MARKETING

Mr **Rik Beukers** (IMARES) presented some of his results of a market survey study “**Market perspectives for pike perch - General characteristics and experiences from the Dutch seafood market**” ([download](#)). He started his talk with some statistics on landing and production of the species, the former still being dominated by capture-fisheries in Eastern Europe. The two major market segments, frozen or fresh product, follow very different rules in terms of price and the reliance on imports. Looking out for the right market segment for a specific type of product (e.g. large filets or portion-size fish) is a prerequisite for each producer who wants to sell his/her fish at an economically meaningful price and should be done before starting a new production. Current experience from other countries has shown that the larger fish traders are not necessarily the only viable option for a regionally oriented producer (e.g. instead selling fresh whole fish to restaurants in urbanized areas).

The overall **conclusion and recommendations** from this session were:

- The lack of high quality, independent data on production statistics and economic figures is striking, the relevance of these data for “informed-decision making processes” for investors (e.g. loan-givers, banks, ...) and governance cannot be over-emphasized,
- The suppliers should stand shoulder to shoulder with the primary producers to position and to market their products in the optimal segment of the market (e.g. in respect to regionality and seasonality) and to get a good price for their product from retailers,
- Marketing strategies for pikeperch and perch products from domestic aquaculture stay, at best, behind their possibilities. To our knowledge there is no example of an integrated marketing strategy that makes use of the benefits of a modern freshwater-fish production (in RAS or pond). This needs to be addressed both from industry-side (transparent production, maybe even certification) and from governance (providing level-ground conditions to improve competitiveness against imports).

5. TRAINING & KNOWLEDGE MANAGEMENT

Mr **Andreas Müller-Belecke** (IfB) gave an insight into “**Training approaches in percid cultivation: The pike perch workshop at the Institute of Inland Fisheries Potsdam-Sacrow (IfB)**” ([download](#)). These 2-day courses take place on a regular base and are a prime example of sharing hands-on experience in the fundamental practices of percid aquaculture, without giving away “top secret” information. They are therefore an ideal entrance into the subject for every interested newbie as well for everyone else with an interest in investment and decision-making processes related to the production of this species. It was emphasized that this course actually provides sound economic calculations on the production costs, derived from more than 15 years of experience on working with the species. It has therefore to be seen as an achievement that NOT every participant of the course started his/her own pikeperch production afterwards. Instead, some of the participants were “put back with their feet on the ground” on what to expect from their future business plans, before spending a fortune on starting a production.

The overall **conclusion and recommendations** from this session were:

- A wealth of knowledge on how to produce percid fish species under various production conditions (pond, RAS) has been accumulated in the last decades. The accessibility of this pool of knowledge is limited by various obstacles (language, confidentiality, educational background, means of publication, ...). Courses like the one at IfB can be a substantial support for newbies and experienced producers at every stage of the carrier. This is especially true when keeping in mind that life-long-learning (LLL) is one of the pillars of the strategic vision of a knowledge-based bio-economy,
- “Informed-decision making processes” and adequate means of communication with (external) stakeholders and policy makers require a more sensitive approach to knowledge management and communication. The role of national and international associations and networks in facilitating this process is of pivotal importance.

The workshop was closed after 5h of intense presentation and interaction. The organizers thanked all presenters for their efforts and all participants for their contributions during the discussion phase.

The **survey sheets** that were distributed among the participants yielded a fairly uniform response. Even though the return rate was low (11), eight (8) producers indicated a doubling of production capacities (area or volume) within the next five years, which will be mainly achieved by expanding or introducing RAS systems. Only one pond producer assumed an increase in pond production area. The current production capacity (round-weight fish) ranged from 10 to 200 t of percid and other species (e.g. trout, sturgeons, carp). Whereas RAS (and pond – RAS combinations) capacities (round-weight fish) are assumed to increase significantly in the next years (at least doubling, up to ten-fold increase), pond producers assumed lower increases in production. Except for the “large producers”, export is currently (and in the near future) not the main sales channel. Most exports are (and will be) directed to central, continental European countries (e.g. DE, FR, CH). High figures in terms of anticipated growth of production were presented for fingerling production, increasing the supply six-fold within the next 5 years. Information on economics of value and turnover were scarcely provided, but in general supported the previous figures on increase in production capacities. The main cost drivers are (and will be) energy, feed and personnel for RAS producers whereas pond producers mainly stated the latter two. All producers indicated an increase in employment (two-fold in average), but hardly more than 10 employees per company. The SWOT analysis reflected the outcomes of the previous discussions, emphasizing the various benefits of percid species for freshwater aquaculture production (strengths) and the current bottlenecks hampering production and marketing (weaknesses). The greatest opportunities were seen in solving the bottlenecks for production and marketing (see above) and in increased consumer demand for locally produced fish, especially when foreign markets will absorb more of the currently available production of other species. New, emerging markets in terms of regionality and product characteristics are seen as the greatest drivers. The major threats are considered to be cheap imports from foreign fisheries (and aquaculture) and lack of finance for expansion.

The summary of the workshop is based on minutes taken during the meeting. They do not necessarily represent the actual intention or point of view of the presenter. All workshop participants are invited to provide feedback/corrections/amendments to these minutes before they will be published in the next EAS magazine. Deadline for feedback is 28th October. Please send all contributions to epfc@aquaculture.cc

What's next, EPFC?

EPFC will continue to exist as a thematic group within the European Aquaculture Society (EAS). Every EAS member is invited to participate in the activities of EPFC. Everybody else is encouraged to join EAS to support the work of EPFC and EAS and to be eligible for the various member-services provided by EAS (conference participation, printed magazine, etc.). Irrespective of EAS membership, everybody can have access to the network, receive E-Mails announcements, become member of the LinkedIn group and can be invited to specific events and activities. A simple expression of interest to epfc@aquaculture.cc will be enough to get in touch with us.

How to make use of EPFC?

The network currently exists of more than 800 contacts from all parts of the world and from all different backgrounds. It is virtually impossible to get equally networked to all of these contacts. Finding the right contact for your specific need/interest is essential. We (the initiators) have the feeling that most of our activities will have to happen in a direct, face-to-face manner. We will therefore concentrate on meetings and workshops (similar to the 1st EPFC workshop, this year), instead of generating newsletters and running a website. As means of communication, we will use our email-list and the group on LinkedIn. Please note that we are doing these things on a pro bono base, i.e. we also have an incentive to keep it as simple as possible for all of us. If you have an event/conference/project or alike in your "surrounding" where you would like to see "something happening for percid fish people", please get in touch with us. If you are looking for specific information about percid aquaculture, policy advice, consultancy or simply have a problem that you cannot solve, please feel free to use our LinkedIn group and/or get in touch with us. We will not be able to help you with all inquiries ourselves, but we will know whom to refer you to instead. Principles of confidentiality and mutual trust do apply for all these activities and it is up to every individual to decide how much you want to share and what to expect in return!

EPFC at EUROTIER 2012 in Hannover

The EPFC will host a special workshop for percid fish farmers and other interested stakeholders during the upcoming [EUROTIER](#) tradeshow in Hannover, Germany. The workshop will be held in German, but international participation is encouraged. Basic translation for discussion will be available.

The workshop will give a summary of the 1st EPFC workshop in Prague and participants will be invited to contribute further conclusions and recommendations. The workshop is targeted at all producers, suppliers and retailers as well as other relevant stakeholders. Results will be used to support national and EU-level policy making processes.

Furthermore, participants will have the opportunity for networking and linking to EPFC.

The workshop will be held on:

Wednesday, 14. November 2012

from **17.00 to 18.30**

in **Meeting Room 11**

in the Convention Center of the "Messe Hannover".

Please note, that registration for the workshop is mandatory! Please send an email to meyer@gma-buesum.de to register. A valid Eurotier entrance ticket will be required to access the workshop venue.

For further information please refer to the [EAS website](#) and our [group on LinkedIn](#).

Rumbeke, Büsum, Vodnany, Oktober 24, 2012

Stefan Teerlinck, Stefan Meyer and Tomáš Polícar

Initiated by:

Dr. Stefan Teerlinck, Inagro, BE, stefan.teerlinck@inagro.be

Stefan Meyer, Gesellschaft für Marine Aquakultur, DE, meyer@gma-buesum.de

Assoc. Prof. Dr. Ing Tomáš Polícar, University of South Bohemia, CZ, policar@frov.jcu.cz

Hosted by:

European Aquaculture Society (EAS)