Sustainable Aquaculture Working Group: Meeting 6

Monday 31 October 2022, 11am, on Zoom

Attendees
Chair Simon Doherty
BVA Officer Justine Shotton
EWAP Andrew Prentis
BVZS Romain Pizzi
Scottish branch Ronnie Soutar
RSPCA Sean Black
BVA staff Megan Knowles-Bacon – Policy Officer (Secretariat)

Guest speaker Peter Scott, British Trout Association

Apologies
Policy Committee Ally Anderson
Research Jimmy Turnbull
FVS Matthijs Metselaar
Vet Sustain Ruth Clements

1. Welcome, introductions and apologies for absence
S. Doherty welcomed the group and thanked Peter Scott for joining as a guest speaker.

2. Minutes from previous meeting
The group approved the minutes as an accurate record of the previous meeting

3. Farming Trout in the UK
Peter Scott joined on behalf of the British Trout Association. He provided an overview of Trout farming in the UK:

History of Trout farming
- A relatively recent expansion – thought to have started in 1870s with Howietoun fishery
- Initially driven by need for restocking fisheries for fishing clubs
- Rainbow Trout first introduced from USA around 1884/5
- Serious production began in UK in mid-1950’s by Danish entrepreneur establishing the Wansford Fish Farm
- Cloan hatchery set up in 1974 to supply a large proportion of the fry needed by the industry
- Large companies Test Valley Trout and Trafalgar Fisheries were established in the early 1970s
Background info/stats

- In 2015, CEFAS recorded production of:
  - 14,839 tonnes of Rainbow Trout
  - 349 tonnes of Brown Trout
  - 11 tonnes of Arctic Char
  - 173 tonnes of Carp
  - 4 tonnes of Tilapia

  None of these sectors have exploded like the Salmon industry, but Trout production is significant
  More recent stats should now be available

- A table trout is usually 350-400g
- To produce 12,000 tonnes of Trout, approximately 30,000,000 eggs will be needed
- Some suppliers are now moving towards producing larger fish. This is specialist production which is becoming very popular in the South of England.
  - 2.5 to 3kg
  - Benefits include lower stocking density and the ability to provide more focussed care for each individual fish

- BTA represents 90% of UK Trout production, for restocking and table production
  - There are around 290 registered Trout farms across the UK.
  - Most Trout farms are SME’s, often with 6 to 10 staff members. Many are owner operated with a couple of staff. There are approximately 1050 people working in the industry.
  - There are farms and hatcheries all over the UK, with many based in England

Trout production overview

- Production starts with broodstock:
  - In the hatcheries, female eggs are stripped into a bowl, then males are also stripped into the bowl to fertilise the eggs.
  - The eggs grow into sac fry, then swim-up fry in the hatchery
  - They are sold on when they reach 5g (approx. 90days old). They are referred to as “hundred to the pound”
  - Fish grow to 300-330g in 12 to 18 months, ready for the table
  - Large fish need 24-30 months to grow. This requires the use of ‘triploids’

- A Trout farm is considered:
  - Large if producing over 100 tonnes/year – there are very few of these in the UK
  - Medium if producing between 20 and 100 tonnes/year
  - Small if producing less than 20 tonnes/year.

- Hatcheries:
  - Commercial sites produce 2-4million eggs/year
  - If production is for their own stock, they usually produce around 200,000/yr

- Small farms:
  - Usually producing a small number of stocking fish for themselves or others
  - May do a small production for the table
  - May use antibiotics once or twice a year

- Large farms:
  - Water is taken from a river, used two or three times, then returned further down stream
Fish move across the farm at different stages. Fish arrive on raceways at 30g, are vaccinated by injection, grown on and graded into circular tanks according to size. As fish are naturally carnivorous, similar size fish are kept together to avoid larger fish potentially eating smaller ones.

- Fish are eventually moved onto finishing ponds and sold at around 3kg.
- UK farms generally use the traditional Danish earth pond system, now a Danish Model 3 recirculation farm has been created, where 10-15% water is replaced each day. In Denmark, the government funded all main farms to replace their systems on the grounds of improved environmental footprints. One site in the UK is trialling this system, but the sector is currently concerned about profitability of making the change since they do not receive funding.

Key focus areas

- **Crowding**
  - This can be stressful for fish, but is a necessary part of handling to keep them in size classes, for vaccinations and for slaughter
  - Managed carefully, monitoring oxygen and fish behaviour
  - Some sites use a fish pump and grading machine to transfer fish in to graded tanks. This process can be completed in less than one minute and reduces stress

- **Slaughter**
  - A lot of work has been going into humane slaughter methods. The challenge is how to do this safely for humans
  - A lot of farms don’t kill their own fish – many go for restocking, and others go to a processor.
  - For on farm slaughter, smaller farms use a priest (weighted stick).
  - Bigger farms use an electrical device which stuns and kills the trout. This is not safe to use alone, so farms need to have sufficient staff available for this. There must always be someone monitoring the receiving bucket to check for signs of life.
  - To improve welfare, slaughter often happens in the early hours of the morning when fish are naturally calmer
  - Except for some of the larger fish, table trout are not bled – the electrical device or priest kills them.
  - CO2 and iced slurry were previously used as slaughter methods, but these are no longer considered humane. There have been some good reviews of welfare at slaughter by FAWC and the EU
  - A small proportion of fish are slaughtered using Ikejime, a Japanese method to destroy the spinal cord. This is cleaner and quicker than using a priest when used properly – training is required.
  - Led by discussions with Bristol university, a gatling gun is being developed to make slaughter quicker, safer and more humane. This would involve fish being fed through a pipe, and a specific electrical wattage delivered.
  - Once slaughtered, fish are not usually processed on site. Only a few larger sites have their own processing unit.

- **Therapeutic pharmaceuticals**
  - Only Aquatet licensed for trout in the UK.
  - Some farms will also use Florocol (licensed for Salmon used on cascade) and Linacivet (licensed in Greece for trout and imported on SIC) if possible.

- **Preventive pharmaceuticals** - Vaccines
  - There are major supply issues with vaccines. The industry lost two of the most important vaccines four years ago, so now have to use multivalent vaccines from the Salmon industry. These are far more expensive, and sometimes too costly for trout farmers to use.
  - Husbandry based methods are used to prevent and control disease as much as possible.
  - The industry is investigating the use of bacteriophage.
Vaccines are supplied direct from the manufacturer, on prescription.

They are usually injected by hand: Fish are netted from a crowded pond, put into anaesthetic then handled when drowsy. Personnel vaccinating fish should wear strong gloves and the needle has safety guards either side of it, but it can still be risky as operators sometimes inject their own hands.

Some farms are starting to use machines for vaccinations, but only the largest farms can afford them and they require bigger fish

- **Antimicrobials**
  - All use is targeted, no preventative use. Antimicrobials are used to treat clinical diseases
  - Metaphylactic – the batch is a unit
  - Florocol is almost all used on fish smaller than 10g, primarily for use against Rainbow Trout Fry Syndrome (RTFS)
  - Oxolinic acid used on all bigger sizes to treat furunculosis and Enteric Redmouth (Yersiniosis)
  - Trimethoprim Sulphate has not been used by the vast majority of the industry for at least 5 years.
  - There are some concerns about resistance to Oxolinic acid forming, so its use is now restricted. However the trout industry relies heavily on this, and without it would need to use more antibiotics as they would be needed in greater doses. Resistance issues are so far apparent on only one farm in *Aeromonad septicaemia*, but this has been seen over multiple years.
  - There are concerns that some producers have been prescribed drugs licenced for horses in questionable doses by their local vet. This highlights the need for more vets to have a basic understanding of fish farming requirements, or to at least know who to contact for advice.
  - Major diseases to treat are redmouth and furunculosis.
  - The bug bank project has been started with the aim of sampling disease outbreaks and to help develop autogenous vaccines.

- **Triploids**
  - Type of fish required as part of the breeding process for larger fish
  - Administering methyl testosterone to a fish (at swim up fry stage) causes sex reversal. These fish are not for human consumption.
  - The sex-reversed cocks (previously female) are then bred with a true female fish, to produce all female eggs.
  - Heat shock or pressure shock treatment then leads to fish being able to grow larger (eg to 3kg)
  - No fish for the table are hormone treated – only the parents.

In discussion, it was also noted:

- Cross breeds and colour morphs are of greater interest to the fishing sector, as they can be more interesting or apparently have more desirable characteristics. Eg “tiger trout” sounds impressive to catch and is thought to be more aggressive

- Non-native rainbow trout are deliberately released into the wild for the fishing industry. They do not tend to establish populations, except in Derbyshire (it is unclear why this site is different). If they did establish, they would compete with the naturally occurring brown trout (in fresh water) or salmon species (in salt water).

- The industry imports large numbers of trout eggs
  - The UK does not have sufficient hatcheries to supply the market
  - Many used to come from Denmark – but disease risk means this is not currently possible
  - North America and South Africa are important sources
  - CEFAS monitors the trade to control for disease risk. They also monitor breeding to ensure it is being carried out responsibly

- Trout produced in the UK is for domestic purposes rather than overseas trade.

- Parasites
Like Salmon, trout farmed in the sea struggle with sea lice.

In freshwater, different parasites are present. These may be an issue in some fisheries, but not usually on trout farms.

Biggest parasite related issue is PKD (Protozoal Kidney Disease). This was a huge constraint on the industry for a long time, but they have learnt to stock around it to avoid the worst impacts.

**Water control**
- Water is taken from rivers, used in the farm, then fed into a settling lagoon.
- It has to be at a certain standard in order to be returned to the river. Solid waste (food and faeces) is settled out. Some removal of bacteria, ammonia etc.
- Sites are designed to allow one lagoon to be turned off whilst another is in use. Settling can take place over several years.
- Solid waste is dug out and used as fertiliser.
- The Environment Agency (EA) monitors the water for medicinal waste. This is not monitored by the farmer. The EA charges farmers for this service.
- The new Danish recirculation method sees 10/15% of water in tanks replaced each day.
- Public concerns over aquaculture often focus on medicines discharge: use is low, so residues are very low. Samples always below the required thresholds. Most farms have consents that do not allow any discharge of antibacterials. The Bug Bank project could look into this further.

**Mortality rates**
- Most of mortalities are at the egg and fry stage, as they naturally would be.
- Once fish are on farms, mortality rates are usually low unless there is a disease outbreak. Once they reach 100g they are usually safe.
- Fish have to be treated before they lose their appetite, as treated feed is the only practical method of providing medication.

**Veterinary input**
- Scottish farms have good access to aquaculture vets.
- In England, a large majority of farms and all hatcheries are covered by one expert veterinary surgeon.
- The remaining farms are all small holdings. The majority are unlikely to be using medicines, through some do occasionally seek prescriptions from locals vets. Local vets sometimes seek advice from others with relevant expertise.
- There is a concern about the limited number of vets involved and access to expertise in the future.

**Cascade application**
- Long withdrawal periods in medicines not licensed for trout, so these can only be used on smaller fish.
- Medicines have to be added to food and mixed. There are no commercially available pre-mixed feeds for trout. All trout farms therefore need to have an approved mixer working for them.

**Diet**
- Sophisticated pellets are fed to trout.
- These contain fish meal, usually from Chilean Sand eels (which are not eaten by humans).
- Increasingly vegetable proteins are being used with amino acids added. Pellets are probably around 50% vegetable protein now.
- Feed is similar to salmon and made by the same companies, so sourcing and sustainability issues will be similar for the two sectors.
- There is a high food conversion efficiency – better than 1:1.

In addition to salmon and trout, other species of interest which are farmed in the UK include carp, sea bream (in Wales) and tilapia.
4. Position review: fish health and welfare
The secretariat had begun drafting the position, predominantly focusing on the fish health and welfare section. Group members were asked to review the work so far.

The group were asked to consider how much detail should be included in the animal welfare section. It was agreed this should be reviewed once other sections had been drafted to ensure it was balanced.

Group members were happy with the general direction and recommendations, suggesting a number of edits to ensure the recommendations were clear.

Action: Secretariat to update wording according to group member comments

5. Themes document review
The themes document had been updated with notes from the previous meeting and then rearranged into sections aligned with the headings of the BVA position on sustainable UK agriculture.

Group members were asked to review the themes document for the sections not included in the draft so far, and to consider suitable recommendations for each section.

Again, the group was happy with the general direction and suggested a number of possible recommendations. To assist with the formation of the draft, members were asked to tell the secretariat about any points they felt strongly needed to be highlighted in the position.

Action: All members to highlight key points and recommendations from themes document

6. Conclusions and next steps
The group agreed to arrange an additional meeting for early 2023 in which to review a more complete draft of the policy position. Any gaps will be identified and discussed online, with the opportunity to invite final speakers to the meeting if needed.

S Doherty reminded group members of the importance of engaging with documents posted on Glasscubes as the position develops.