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Circularity in Live Stock and Fish supply chains

TEAM C

Although many professional companies operating in livestock & fish supply chains have sustainability programs and/or certifications, not many of them have focused on the circularity of these supply chains.

In dairy supply chains, for example, there is a strong focus on the reduction of emissions of Greenhouse Gases. Research has shown that single focus on the emission of Greenhouse Gases using the footprint concept can lead to strategies that have a negative impact on the feed-food competition aspect, meaning that dairy cows will consume more feed that in principle can be consumed by humans.

With regards to the fish supply chain an estimated 30-40% of the biomass (fish as raw material and input for human consumption) is wasted with discards at sea, during processing (e.g. bones, guts, heads etc.) and before or with consumption (wasted or by spoilage). And side streams (processing water containing minerals, proteins, omega-3 acids) is often wasted. This shows the enormous opportunity to reduce waste, and upcycle this streams into food, feed or biomass.

These examples show that, although many supply chains have a focus on sustainability, enormous progress with respect to sustainable food systems can still be made if the concept of circularity is included in their approaches. Additionally the livestock and fish supply chains can boost this transition through requirements and incentives for farmers and fisherman.

Insight into the concept of circularity and the monitoring thereof is needed to support businesses in this transition. This helps answering questions like: (1) can we upcycle waste and residue streams from waste to feed or biomass or even from feed to food and (2) what type of strategy can support the transition towards sustainable circular supply chains and is economically feasible as well. To develop strategies for circular livestock & fish supply chains we have identified the following steps:

- To identify sustainability strategies of stakeholders in livestock & fish supply chains and to analyse to what extend circularity is included
- To identify KPI’s that determine the current circular position of different livestock/fish global supply chains
  - KPI’s at processor level (e.g. what is the percentage of waste, biomass, feed and food?)
  - KPI’s at farmer/fisherman level (e.g. what is the percentage of land that can only be used for feed and is not suitable to be used to grow vegetables or fruits?)
  - KPI’s at feed ingredient level (e.g. what is percentage of feed ingredients that does not contribute to feed-food competition?)
  - KPI’s before or at consumer level (what is the percentage of waste in retail and at consumer level?)
- To assess the current circularity ‘status’ of a number of selected global supply chains
- To develop potential strategies for livestock & fish supply chains to achieve targets for the reduction of emission Greenhouse Gases in line with the Paris agreements, while securing the circular principles as far as possible.

Team C worked on promoting circularity initiatives in different livestock and fish supply chains. In cooperation with the Animal Production Systems chair a research has been initiated that is identifying KPI's for circularity at dairy farm level. In the fish supply chains Team C is looking into large bio-based industry partners for seafood that are leading in Norway and Iceland with innovative products for food (human consumption) and feed (feed for agriculture and aquaculture) made from waste streams.

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This sheet is a product of TEAM C, an agile team that has worked on one circular food system based on the principles of Imke de Boer and Martin van Ittersum on behalf of Martin Scholten

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