Food and feed safety and valorisation of new and legally limited former foodstuffs for animal feed

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Background

The Dutch Ministry of Agriculture, Nature and Food Quality has published a mission and realization plan for circular agriculture for 2030. The agricultural system must be regarded as a whole, in which raw materials from each other's chains and residual flows from the food industry and food chains such as crop residues, food residues, process waste, manure, compost are reused or processed into new (auxiliary) products.

Objective

Under-utilized former foodstuff, whether permitted by law or restricted by law, are investigated on food and feed safety to be able to close cycles. New knowledge, insights and technologies enable The Netherlands to maintain its knowledge and production lead and strengthen the Netherlands' position as a developer of integrated solutions for sustainable food systems. In this project the following former foodstuffs (FFPs) are investigated for valorisation:

- FFP1: McDonald’s baked French fries, fried and salted; from restaurant kitchen
- FFP2: McDonald’s other kitchen waste except for packaging materials and other inedible objects
- FFP3: Hatchery by-products
- FFP4: Bovine haemoglobin
- FFP5: Catering waste
- FFP6: Vegetable, fruit and food leftovers.

Audit hatchery by-products Symrise (FFP3)

Egg shells from hatcheries are currently seen as category 2 material. This trial aims to design a process and business case to separate the shells in order to classify them as category 3 waste, suitable for animal feed.

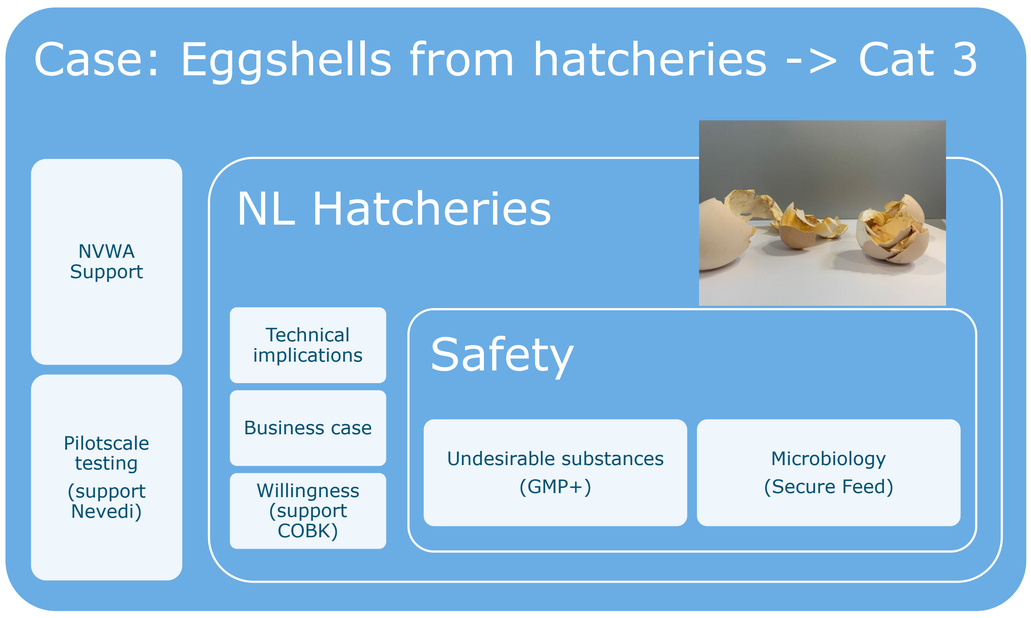

Figure 1. Parties and steps involved for ‘upgrading’ eggshells to category 3 material.

General approach

FFPs are systematically investigated in order to build a HACCP file which can be audited by The Netherlands Food and Consumer Product Safety Authority (NVWA) and The Dutch Ministry of Agriculture, Nature and Food Quality on the following items:

1. Chain inventory/analysis
2. Hazard inventory
3. Processing methods for residual streams
4. Chemical hazard characterization
5. Assessment of theoretical nutritional value of (processed) residual streams for the target animals.

When a HACCP file is audited, a feeding trial may be undertaken as a pilot for scaling up the usage of the FFP for animal feed.

Processing methods McDonalds kitchen waste (FFP1 and 2)

Securing restaurant kitchen waste was performed using heat treatments, enzymatic treatments and fermentation methods. This in order to increase digestibility and maintain the nutritional value of the FFP. Furthermore, an assessment can be made of the scalability of this process to provide an outlook for a potential feeding trial.

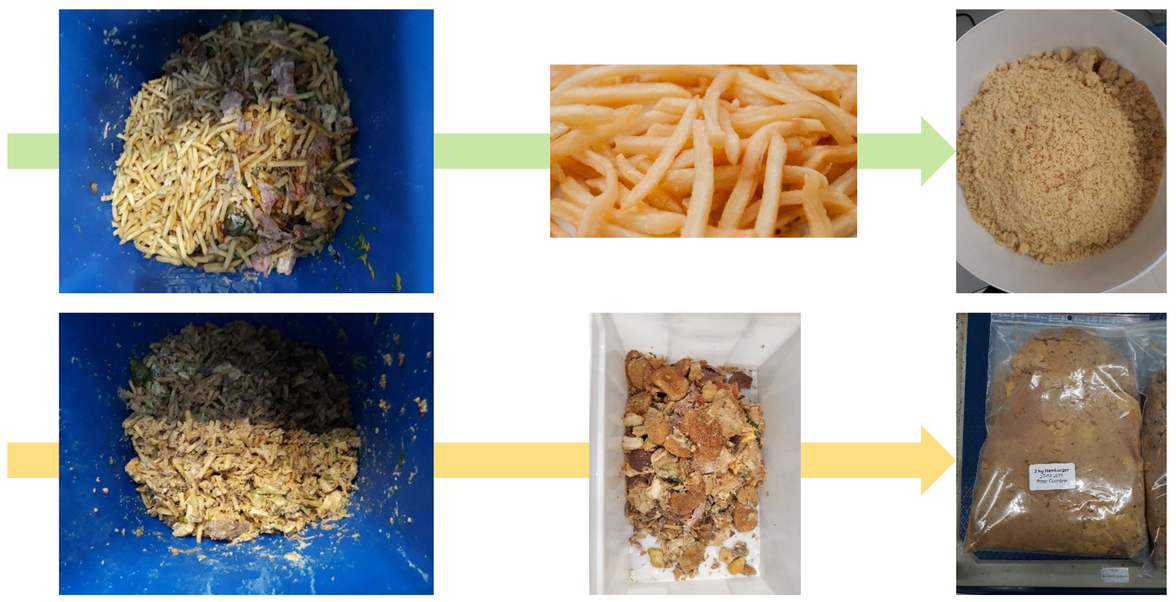

Figure 2. Reception and pre-treatment of FFP1 (top) and FFP2 (bottom) from McDonalds. From left to right: receipt in 120-liter container, fractionation, material after blender

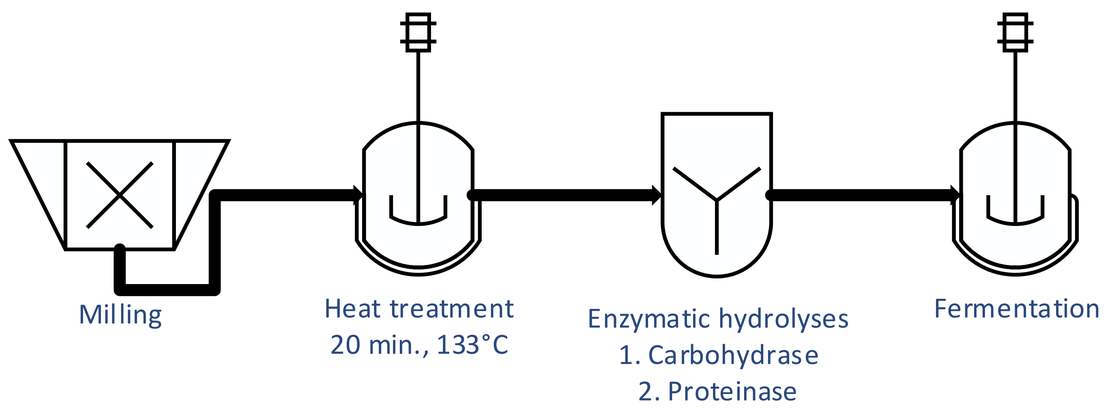

Figure 3. Schematic representation of FFP1 and FFP2 processing

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