# Project Towards measurable process conditions at the feed factory

## May 2020

The project is now in phase 4:

The ranking is known! The main argument for animal feed companies to participate in this project turned out to be:

I want a manageable and controllable process in a "smart plant" with real time data.

As Feed Design Lab we are very pleased to be able to announce this to you; we see this as an incentive and extra motivation to deal with a topic in which a large part of our sector is interested. With this backing, we will be inviting the network in the near future to discuss the desired further interpretation of this argument.

## March 2020

#### The project is now in phase 3:

Actively engage feed production companies using the following statement: "Within the FDL project group "Towards measurable process conditions", research will be performed into which parameters relating to the process of conditioning up to and including cooling and drying can provide additional information regarding the production process. This data can be utilised to optimise the production process, making it more effective, economical and sustainable.

Which arguments in this respect are most valid for you, what is the main issue in your view?"

For this part of the project, project leader Eric Vissers asked for arguments, which feed companies describe as the most important for the project. These arguments are now ranked and presented in a table. This is used to make a choice which goals will be executed in the project.

# Dec 2019

#### Introduction

During the pelleting and extruding of animal feed, a number of processes occur that affect the nutritional, microbiological and physical quality of the feed. In practice, there is often insufficient knowledge available of the factory's own process and preserving the nutritional value of the raw materials.

#### Feed production process

During conditioning, precompacting, pelleting or extruding, the product is subjected to moisture and heat (steam), retention time and pressure. In most cases, these process conditions are not measured or only to a limited extent. Some conditions (such as grain temperature) cannot even be measured reliably to date. Reliable data on these process conditions in order to make responsible predictions about nutritional product quality is therefore often lacking.

#### Nutritional quality

Moisture, temperature and pressure have a major impact on the digestibility (accessibility) nutritional value (of raw materials and additives) and hygiene (Salmonella) of feed. The requirements for temperature, pressure or moisture relative to the above factors are often contradictory: e.g. complete destruction of Salmonella requires a higher temperature than is desirable for the preservation of enzymes. The resistance of most additives and raw materials to temperature has been examined in laboratory conditions, however in many cases there is insufficient information about retention times, moisture and pressure under process conditions. Project

This project aims to develop a system to obtain and analyse reliable process data. Based on this data, a method suitable for practical application can be developed that will enable the desired process conditions for a specific animal feed quality to be predicted. In a subsequent project, research can be performed into identifying correct and practically applicable biomarkers which can be used in the process to test additives.

The goal is to collect reliable data based on correct sensoring and subsequently process this data to generate a clear overview. Based on this overview, systems can be built which will assist the animal feed industry in selecting the right process conditions for a specific animal feed.

### Final results to be achieved

- Knowledge of sensoring in process steps conditioning, precompacting, pelleting/extruding and drying/cooling
- Knowledge of data analysis and application in the animal feed production process

### Plan of approach

The following approach is proposed:

- 1. Establish project definition with target customers or stakeholders.
- 2. Identify which data is needed and how and where in the process this data can be measured.
- 3. Actively engage feed production companies using the following statement: "Within the FDL project group "Towards measurable process conditions", research will be performed into which parameters relating to the process of conditioning up to and including cooling and drying can provide additional information regarding the production process. This data can be utilised to optimise the production process, making it more effective, economical and sustainable.

Which arguments in this respect are most valid for you, what is the main issue in your view?"

- 4. Collect accurate data that helps us better understand the parameters that affect the process.
- 5. Place sensors in the process at Feed Design Lab, collect and analyse data

Interested in participating in this project? Please contact Eric Vissers: tel: +31 628 13 22 20 or <u>ericvissers@feeddesignlab.nl</u>.