MODULE 1 | FEEDSTUFFS: CEREALS, CEREAL BY-PRODUCTS AND INDUSTRIAL BY-PRODUCTS

Formulating animal feed is a complex task. Many different feedstuffs are available with very different nutritional characteristics. Nutritional quality and feed safety of feedstuffs need to be considered in formulating animal feed next to the cost price. Many typical characteristics of feedstuffs are not considered in linear programming, so that usage greatly depends on the knowledge and skills of the persons using the least cost formulation programs. This module brings feeding value, feed quality and feed safety together.

Learning objectives

- To obtain knowhow on the nutritional value of feedstuffs, the reasons for variation in the nutritional quality and the usability in formulating feeds for different species, by studying the origin and characteristics of each feedstuff.
- To obtain knowhow on how this practical knowledge can be used in quality control, purchasing of feedstuffs and formulation of feeds.

MONDAY JUNE 3

1.1 Welcome and introduction

1.2 Cereals

The characteristics, critical points, (chemical, mineral, amino acid and fatty acid) composition and nutritional value of f.i. maize, wheat, triticale, barley, rye, oats, and sorghum will be discussed.

- The effect of processing on grains
- New grains or old harvest; Myth or reality?!

1.3 Cereal by-products

In brief the technological processes from which the by-products are derived and what the critical control points are in these processes will be discussed and how this affects the chemical composition and nutritional value. The following by-products will be discussed:

- Maize by-products: maize gluten feed meal, maize gluten meal and maize feed meal
- Wheat by-products: wheat middlings, wheat gluten feed and wheat gluten meal
- Barley by-products: barley feed meal, brewers grains and malt sprouts
- Rice by-products: rice bran and rice hulls
- Bioethanol production by–products: maize and wheat DDGS, wheat yeast concentrate (liquid)

1.4 Other Industrial by-products

Similar as for cereal by-products, in brief the technological processes from which the by-products are derived and what the critical control points are in these processes will be discussed and how this affects the chemical composition and nutritional value. The following by-products will be discussed:

- By-products from potato processing: potato steep water, potato protein, potato starch, protapec
- By-products from sugar production: sugar beet pulp, cane sugar or beet molasses and vinasse
- Citrus pulp
- Tapioca
- Cookie mix
- Dairy products: whey and delactosed whey
- By-product from biodiesel production: glycerol

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Remarks:

- To get a complete overview of relevant feedstuffs this module can be combined with module 2 Feedstuffs: By-products of fat oil extraction, legumes, animal by-products and fats and oils.
- To be able to apply the information from this module into feed formulation, it is recommended to attend module 10, 13 or 16 Practical Feed/Ration Formulation.