Feeding experiments for the examination of the possible application of different animal feed as alternative for maize for different ways of animal production (milk production, fattening cattle)

**Objective:**
Assessment of alternative animal feedstuffs to maize for feeding cattle

**Short description:**
In Bavaria, feeding cattle with maize silage is a common method, which is practiced even in for maize unfavorable locations. With increasing feed costs a partial substitution of maize by grass silage could be economically reasonable. Especially against the background of bioenergy production from cereals and maize, a competitive situation can evolve and grass as feedstuff can be of a higher interest. Furthermore, a broader spread of the Western Corn Rootworm could lead to limitations in the availability of maize silage and therefore, to a higher amount of grass silage in the ration of fattening bulls.

This project investigates in two feeding experiments with 72 fattening bulls each (200 to 750 kg biomass) to what extent grass and Lucerne-grass silage can be applied successfully in feeding cattle. In both experiments maize silage is substituted in three steps by grass and Lucerne-grass silage respectively (0 %, 30 % and 60 % of grass and Lucerne-grass silage respectively). Besides the animal-individual feed uptake, the nutrient supply, the fattening performance and the carcass yield, parameters of fatty degeneration of the living animal (back fat thickness) is recorded.

In feeding dairy cattle the ideal composition of the respective concentrate in combination with different silages from forage crops is important. Grain maize, typical part of a ration for dairy cattle, is a source of slowly available starch, which is in addition ruminal rather lowly degradable. Against the background of a possibly limited availability of grain maize, this experiment investigates if maize can be appropriately exchanged by cereals in combination with a base ration consisting of Lucerne-grass silage. Thereby, it has to be considered that cereals provide a quick availability of starch and the starch is highly degradable.

In a ten-week experiment with 36 dairy cows divided into two groups, the impact of the exchange of grain maize against cereals in the concentrate in combination with Lucerne-grass and grass silage, respectively, is tested.

As criteria of measurement, the animal-individual feed uptake, the nutrient supply as well as the milk performance and the milk ingredients will be recorded. To be able to collect data on the influence of the ration composition on the body functions of the animals, the condition of the bodies of the animals is evaluated after the BCS (Body Condition Score) system. Further, as an objective evaluation criterion, the back fat thickness is measured via ultrasound.

In both parts of the project (milk production, fattening cattle), digestion experiments with muttons are conducted for a proper description of the feed value of the rations applied.

**Feeding experiment fattening bulls:**
- Maize silage with increasing portions (30 and 60 %) of
  - Grass silage
  - Lucerne-grass silage

**Feeding experiment dairy cows:**
Assessment of the optimal concentrate composition
Substitution of grain maize by wheat in the concentrate (differing starch degradation)
Observation of feed and nutrient uptake, growth, carcass yield and milk performance criteria respectively

Duration: 2009-2012

Project partner:
Bavarian State Research Center for Agriculture (LfL), Institute for Animal Nutrition and Feed Management, Munich, Germany

List of publications: