PRACTICE ABSTRACT

Using raw soya beans with reduced content of trypsin inhibitors in organic pig fattening

Problem

Soya beans naturally contain inhibitors that reduce the digestibility of protein. These components are deactivated by heat (e.g., toasting) to enable feeding to monogastrics. Meaningful reductions can be achieved through the selective breeding of soya bean varieties with a low content of these inhibitors. Currently there is little knowledge in Europe available about the potential of these varieties in organic pig fattening.

Solution

Evidence from recent trials in Austria indicate that raw soya beans with reduced content of trypsin inhibitors can be used in pig feeding. This Practice Abstract outlines key points which are essential to maintain a favourable growth performance.

Benefits

Successful use of raw soya beans with reduced content of trypsin inhibitors enables farms to become more independent in their feed supply. Costs for thermal treatment can be saved.

Applicability box

Theme
Processing and handling of harvested feed

Geographical coverage
For all farms where soya can be grown

Application time
On demand

Required time
Time for sample collection, posting to laboratory and interpretation of testing reports should be accounted. Preparation of feed ration.

Equipment
Sample bags and standard lab equipment

Best in
Farms with animal husbandry and arable production

Ripe soya bean pod. Photo: Donau Soja

Special soybean varieties with reduced trypsin inhibitor content can be included without heat treatment in the ration. Photo: FiBL

Practical Recommendations

Soya bean cultivars differ in their trypsin-inhibitor content which is measured as trypsin-inhibitor activity (TIA). The soya bean variety “Xonia” is special due its reduced TIA content.

- Raw soya beans of standard varieties contain about 30-50 mg TIA/g soya bean
- TIA content in soya bean varieties with low content is about 10 mg, although current trials indicate that the TIA content can differ significantly between batches. (example: Xonia)

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The following recommendations were derived from feeding tests in Austria during 2017 - 2020.

- Since the TIA value differs between batches, the TIA of all available batches of raw/untreated soya beans must be known to adjust the ration.
- Recent trials indicate that a mixing rate of more than than 10% raw "Xonia" soybeans in rations of organic pigs can result in significant reduction in feed intake, weight gain and feed conversion ratio. If higher quantities of raw Xonia are used, economic disadvantages must be expected, especially due to higher feeding costs and a lower number of fattened pigs per year.
- When using whole soya beans, special care must be taken to ensure that there is no energy surplus so that an adequate protein-energy balance is achieved.
- For achieving a satisfying lean meat quality the content of polyenoic acids in the ration should be carefully managed.

Outlook

Further breeding progress is needed to increase the use of raw soya beans without thermal treatment. As any heat treatment also leads to damage of the amino acids and thus reduces their availability to the animal, further work should be done on the potential of trypsin inhibitor reduced soya bean varieties

Further information

Further reading

In Central Europe, research teams in Austria and Germany are conducting feeding trials with pigs and poultry on the effects of soya bean feed with high and low TIA values:

- University of Natural Resources and Life Sciences, Vienna (BOKU). Institute of Animal Nutrition, Livestock Products, and Nutrition Physiology (TTE). Contact person: Prof. Wolfgang Wetscherek
- Agricultural Chamber of Lower Austria. Contact person: Helmut Raser
- Bavarian State Research Center for Agriculture (LfL). Institute for Agricultural Engineering and Animal Husbandry. Contact person: Stefan Thurner
- University of Rostock. Department for Nutritional Physiology and Animal Nutrition. Contact persons: Dr Reinhard Puntigam and Dr Julia Slama

Weblinks

- AGES - Austrian Agency for Health and Food Safety. AGES offers an evaluation of feed tests and is capable of analysing also trypsin inhibitor activity. Further information on the AGES website: www.ages.at/en

About this practice abstract and OK-Net Ecofeed

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