Effect of Hostazym® X on digestibility of cereals and protein by-products in broilers

Trial description

1 Set-up

- **Location**: Feed Innovation Services, The Netherlands.
- **Trial period:** Autumn 2014
- **Digestibility study**:
  - 56 cages of 6 female broilers (ROSS 308) each. In total 8 cages were used per feedstuff, of which 4 cages control diet and 4 cages control diet + Hostazym® X at 1500 EPU//kg of feed.
  - From each feedstuff tested, 2 different batches were used to include possible variation within a feedstuff.
  - Broilers were fed the same starter feed until 13 days of age.
  - From 13 to 22 days of age, animals were fed with the treatment diets. Day 13 to day 18 was considered as the adaptation period, while from day 18 to day 22 the digestibility study was conducted and excreta were collected.

2 Treatments

- **Cereal diets**
  - Wheat, corn or barley added at 65%, combined with a 35 % base protein (soybean meal) complementary feed.
- **Protein diets**
  - Soybean meal or DDGS (from wheat) added at 30%, combined with a base complementary feed containing corn and wheat in a 50/50 ratio.
  - Rapeseed meal added at 10 or 20 %, combined with a base complementary feed containing corn and wheat in a 50/50 ratio.

3 Measured parameters

- **Broiler performance:**
  - Total weight at arrival, day 13 and day 22.
  - Daily feed intake from day 13 to 22.
  - Total faecal droppings from day 18 to 22.
  - Water intake from day 18 to 22.
- **Digestibility (day 18 to 22):**
  - Analysis of feed: determination of dry matter, gross energy, starch and fat.
  - Total amount of faecal material produced (dry). After homogenisation and subsampling, 250 g was freeze-dried to determine the dry matter content. The dry matter was then analyzed for energy, starch and fat.

- Calculations:

$$\text{Digestibility (\%)} = \frac{\text{Total nutrient intake by feed - total nutrient output by faeces}}{\text{Total nutrient intake by feed}} \times 100$$

Results

Metabolisable energy

- In all diets the inclusion of Hostazym® X increased the metabolisable energy (AME), varying between 33 kCal/kg (rapeseed meal 10 %) and 120 kCal/kg (DDGS 30 %) (Fig.1).
- The 65 % corn or 65 % barley diets supplemented with Hostazym® X, showed a bigger increase in AME (104 and 94 kCal/kg resp.) compared to the 65 % wheat diet (45 kCal/kg).
- The 30 % soybean meal diet supplemented with Hostazym® X, showed an increase of 89 kCal/kg, which is in between the 45 and 104 kCal/kg AME increase for the pure wheat and pure corn diet respectively.

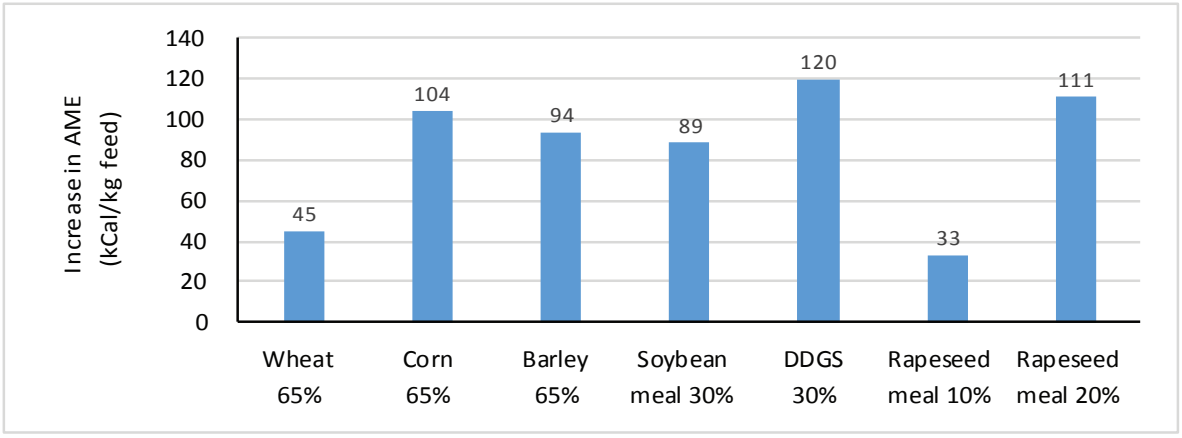

Fig. 1: increase in AME (kCal/kg feed) by inclusion of Hostazym® X at 1500 EPU/kg feed.

1,500 EPU is equivalent to 50g of Hostazym X50 microGranulate per tonne of feed

Fat digestibility

- The inclusion of Hostazym® X increased fat digestibility between 1.2 % (soybean meal 30 %) and 7.7 % (DDGS 30 %) (Fig. 2).
- The increase in fat digestibility is bigger for the corn diet (+5.4 %) and barley diet (+3.2 %) than for the wheat diet (+1.6 %).
- The increase in fat digestibility explains 20-35 % of the increase in AME (Fig. 1). As starch digestibility was not altered by the inclusion of Hostazym® X (starch digestibility was already > 96 % in all diets; data not shown), the additional effect might be coming from increased fibre degradation and/or improved gut health.

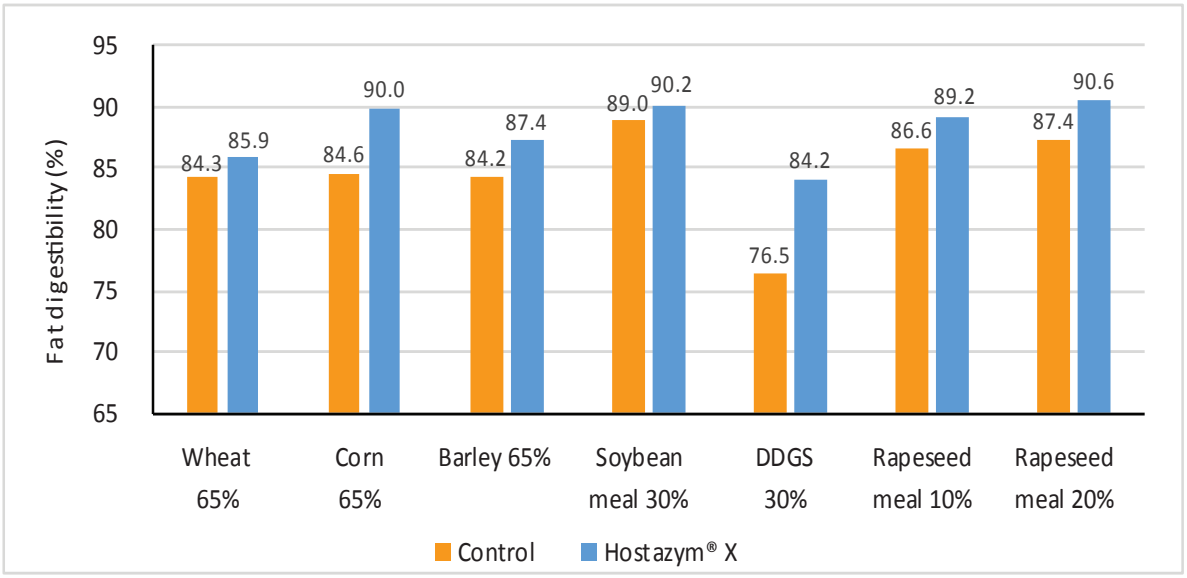

Fig. 2: fat digestibility (%) with or without Hostazym® X at 1500 EPU/kg feed.

Litter quality

- The inclusion of Hostazym® X led to a reduction in faecal droppings (as DM weight), indicating a better digestion of the feed (Fig. 3).
- The inclusion of Hostazym® X led to a reduction in daily water consumption, which might be linked to a reduced viscosity in the gut
(Fig. 4).
- As a consequence of the effects shown in Fig. 3 and 4, a reduction in wet litter in field conditions can be expected when using Hostazym® X.

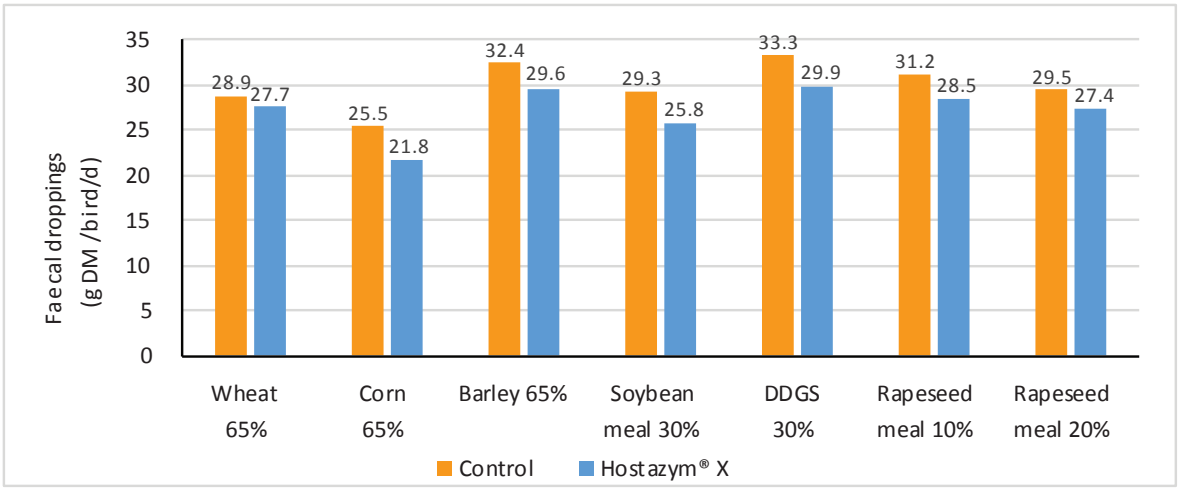

Fig. 3: daily faecal droppings (g DM/bird/d) with or without Hostazym® X at 1500 EPU/kg feed.

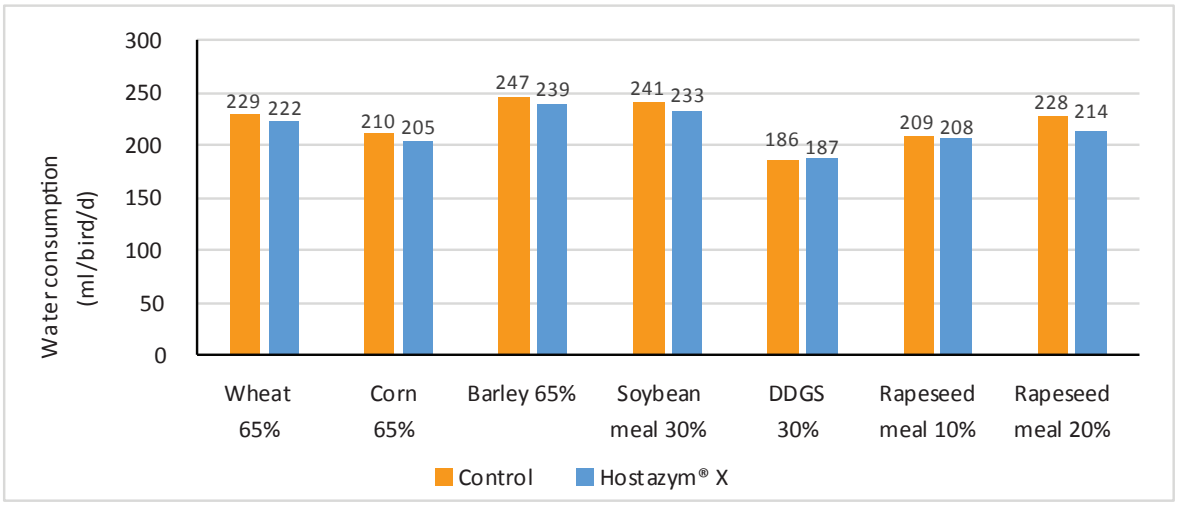

Fig. 4: daily water consumption with or without Hostazym® X at 1500 EPU/kg feed.

Conclusions

The inclusion of Hostazym® X led to :

- an increase in AME which was highest in the DDGS based diets, followed by the diet with 20 % rapeseed meal, 65 % corn or 65 % barley.
- an increase in fat digestibility, highest for the corn diet and followed by the 30 % DDGS diet.
- a reduction in faecal droppings (DM), indicating an increased digestibility of the feed.
- a reduced water consumption, leading to a lower risk of wet litter.