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Digestible energy content of corn and triticale when fed to finishing pigs (2007)

Authors

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DIGESTIBLE ENERGY CONTENT OF CORN AND TRITICALE WHEN FED TO FINISHING PIGS¹

C. Feoli, J. D. Hancock, C. R. Monge, and T. L. Gugle

Summary

A total of 96 pigs (average initial wt of 201 lb) was used to determine the DE content of corn and triticale. The pigs were sorted by sex and ancestry, blocked by weight, and assigned with 12 pigs/pen and four pens/treatment. The diets were corn (97.5% of the formulation) and triticale (97.8% of the formulation) with added vitamins, minerals, and amino acids. Feed (meal form) and water were consumed on an *ad libitum* basis. The pigs were allowed to adjust to the experimental diets for 4 d. On the afternoon of d 4 and morning of d 5, feces were collected from no less than six pigs/pen (via rectal massage). The feed and fecal samples were dried, ground, and analyzed for concentrations of DM, N, and GE with chromic oxide used as an indigestible marker. Digestibility of DM was greater ($P<0.03$) for pigs fed corn vs triticale (82.8 vs 81.2%, respectively). However, the opposite was true for digestibility of N ($P<0.002$) with values of 67.8% for corn and 74.7% for triticale. Digestibility of GE was not different ($P>0.26$) among the cereal grains. However, when the gross energy for the cereals was multiplied by their respective digestibility coefficients, triticale grain had greater ($P<0.02$) DE with a value of 1,531 kcal/lb vs 1,479 kcal/lb for corn. The DE of the corn used in this experiment was low compared to NRC values, but nonetheless our

results indicated that this particular triticale was utilized well by finishing pigs supporting greater digestibility of N and having greater DE than corn.

(Key words: feed ingredients, triticale.)

Introduction

Triticale is a hybrid resulted from a cross between wheat and rye. This “small grain” crop was developed as a forage source for cattle and for its improved protein quality (e.g., greater lysine content) for nonruminants. Development of new varieties has renewed interest in this cereal as a feedstuff in Kansas but also has led to questions about its feeding value for pigs. Therefore, the objective of the experiment reported herein was to determine the nutrient digestibility of corn and triticale when fed to finishing pigs.

Procedures

A total of 96 pigs (average initial weight of 201 lb) was used. The pigs were sorted by sex and ancestry, blocked by weight, and assigned to pens. There were 12 pigs/pen and four pens/treatment. Diets (Table 1) were yellow corn (97.5% of the formulation) and triticale (ThunderCale as 97.8% of the formulation) with added vitamins, minerals, and amino acids. The diets had 0.52% lysine,

¹Appreciation is given to Ehmke Seed for supplying the triticale (ThunderCale) used in this experiment.

0.45% Ca, and 0.40% total P with 0.25% chromic oxide added as an indigestible marker.

Table 1. Composition of Diets, %^a

| Ingredient | Corn | Triticale |
|----------------------------------|--------|-----------|
| Cereal grain | 97.53 | 97.83 |
| Limestone | 0.89 | 0.95 |
| Monocalcium phosphate (21% P) | 0.60 | 0.37 |
| Salt | 0.20 | 0.18 |
| L-lysine HCl | 0.34 | 0.18 |
| L-threonine | 0.03 | - |
| L-isoleucine | 0.02 | - |
| Vitamin premix | 0.03 | 0.05 |
| Sow add pack | 0.02 | 0.06 |
| Trace mineral premix | 0.09 | 0.13 |
| Chromic oxide ^b | 0.25 | 0.25 |
| Total | 100.00 | 100.00 |

^aDiets were formulated to 0.52% lysine, 0.45% Ca, and 0.40% total P.

^bUsed as an indigestible marker.

Feed (meal form) and water were consumed on an *ad libitum* basis with pigs and feeders weighed on d 0 and 5. The pigs were allowed to adjust to the experimental diets for 4 d. Feces were collected from no less than six pigs/pen (via rectal massage) on the after-

noon of d 4 and morning of d 5. The feed and fecal samples were dried, ground, and analyzed for concentrations of DM, N, GE, and Cr to allow calculation of apparent digestibility of nutrients using the indirect ratio method. All data were analyzed as a randomized complete block design using the MIXED procedure of SAS with a significant F-test indicating treatment differences.

Results and Discussion

The pigs gained weight (an average of 1.75 lb/d) and ate the diets well (greater than 7 lb/d) during this brief (5-d) experiment. Comparison of nutrient utilization among the cereals showed digestibility of DM was greater ($P<0.03$) for pigs fed corn vs triticale (82.8 vs 81.2%, respectively). However, the opposite was true for digestibility of N ($P<0.002$) with values of 67.8% for corn and 74.7% for triticale. Digestibility of GE was not different ($P>0.26$) among the cereal grains. However, when the gross energy for the cereals was multiplied by their respective digestibility coefficients, triticale grain had greater ($P<0.02$) DE with a value of 1,531 kcal/lb vs 1,479 kcal/lb for corn. The DE of the corn used in this experiment was low compared to NRC values, but nonetheless our results indicated that this particular triticale was utilized well by finishing pigs supporting greater digestibility of N and having greater DE than corn.

Table 2. Digestibility of Nutrients in Corn and Triticale for Finishing Pigs^a

| Item | Corn | Triticale | SE | P value |
|----------------------------------|-------|-----------|-----|----------------|
| Digestibility, % | | | | |
| Dry matter | 82.8 | 81.2 | 0.8 | 0.03 |
| Nitrogen (protein) | 67.8 | 74.7 | 1.6 | 0.002 |
| Gross energy | 81.1 | 80.5 | 0.9 | - ^b |
| DE content of the grain, kcal/lb | 1,479 | 1,531 | 16 | 0.02 |

^aA total of 96 pigs (12 pigs/pen and four pens/treatment) with an average initial weight of 201 lb.

^bDash indicates $P>0.15$.