

Variation in the Digestible and Net Energy Content of Field Peas in Growing Pigs

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Field peas express a high variability in composition, due to genetic differences and variation in growth conditions. This project aimed to study the consequences of that variability on the digestible (DE) and net energy (NE) contents of field peas in growing pigs. Pea samples were collected on-farm in different parts of Western Canada in 2005.

All the samples (50) were analysed. Their crude protein, starch and total neutral detergent fibre (NDF) contents ranged, respectively, from 19 to 28 %, 39 to 51 % and 13 to 24% of the dry matter. Based on their composition, 23 samples were selected and their DE content was measured in growing pigs at 2 bodyweights (20-25 kg and 50-60 kg). A basal diet composed of barley, wheat, soybean meal, minerals and Celite (source of insoluble ash, used as a marker; 0.4%) was formulated and 23 diets containing 30% peas, at the expense of the basal diet, were prepared. A total of 144 pigs were fed with one of the 24 diets (6/diet) and a faecal sample was collected by grab sampling for 3 consecutive days, after a 10d-adaptation period. The procedure was repeated when the pigs had reached 50kg bodyweight. The DE content of the pea samples alone was calculated by difference. Their NE content was calculated with prediction equations. The average DE and NE in 20kg- and 50kg-pigs were, respectively: 3,715 and 3,923 kg DE/kg DM and 2,577 and 2,715 kcal NE/kg DM. The range of variation was extremely high: from 3,185 to 4,555 kcal DE/kg DM and from 2,222 to 3,084 kcal NE/kg DM. The DE and NE content was higher in 50kg-pigs (+ 208 kcal DE and + 138 kcal NE/kg DM; $P < 0.001$) and there was a high correlation ($P < 0.001$) between the results obtained in small and large pigs. Attempts to establish a relationship between the composition of the peas and their energy contents failed: the correlation with ADF was 0.09 ($P > 0.05$) and that between NDF and DE was -0.22 ($P > 0.05$).

Implications: Field peas are an excellent source of energy for growing pigs but the variation in DE and NE contents is high among pea samples grown in different conditions. No correlation has currently been found between the pea energy value and their chemical composition.