

Saichon Lerdsuwon 2008: The Studies of Extrusion Process and Utilization of Extruded Corn in Piglets and Broiler Chickens. Doctor of Philosophy (Animal Science), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Assistant Professor Seksom Attamangkune, Ph. D. 110 pages.

Experiment 1: Rate of water flow (l/h) in extrusion process of corn were studied in order to determine the processing characteristics and starch utilization. Whole corn kernel was extruded with three different water flow rate (16, 19 and 22 l/h) whereas the ground corn was extruded at 18, 22 and 24 l/h of water flow rate. The results from both studies indicated that the increase in water flow rate subsequently decreased ($P<0.01$) the extruding electrical energy consumption, increased ($P<0.05$) the moisture and bulk density of coarse extruded corn, increased ($P<0.01$) the grinding electrical energy consumption and decreased ($P<0.05$) the enzyme susceptibility. In addition extruded corn from both studies was found to have lower moisture and fat contents compared to the whole corn kernel.

Experiment 2: The storage time of ground corn and extruded corn was studied to elucidate its effect on nutrients and rancidity characteristics. The extrusion process decreased ($P<0.01$) the moisture, fat and TBA value of corn. The increase in storage time (up to 2 months period) increased ($P<0.01$) both moisture and TBA value. However, the protein, fat and ash contents were not significantly different. Besides the moisture content in both ground corn and extruded corn had positive correlation with TBA value and ground corn subjected to longer storage time tended to have higher TBA value than extruded corn.

Experiment 3: Extruded corn was utilized in nursery pigs diets in order to determine the ME value of extruded corn and growth performance characteristics. The ME of extruded corn was found to be 3653 kcal/kg compared to 3497 kcal/kg in ground corn. Pigs fed extruded corn diets demonstrated lower ($P<0.05$) ADG and FCR than those fed ground corn or broken rice diets. No significant differences in daily feed intake and mortality were observed among the dietary treatments.

Experiment 4: ME value and growth performance of broilers fed extruded corn were studied in this experiment. The ME value of extruded corn were 2716 kcal/kg compared to 3127 kcal/kg in ground corn. Broiler chickens fed extruded corn diet were not significantly different in growth rate, feed intake and FCR compared to control diet. Feed pelletization of extruded corn diet was found to improved ($P<0.01$) ADG and FCR.

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Thesis Advisor's signature

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