Title: Legumes for poultry - Improvement of lupins and lathyrus for broilers and egg layers by enzyme treatment

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Byline

This research is aimed at making locally-produced legumes, lupins and lathyrus, acceptable substitutes for expensive imports such as soybean meal or animal-protein meals for inclusion in poultry diets. Researchers investigated the role that pectinase enzymes might play in improving the nutritive value of these legumes to increase the digestion of nutrients, improve food conversion efficiency and, at the same time, reduce excessive water intake, wet droppings and soiled eggs associated with these legumes.

Summary

This research aims to assist Australian poultry producers as they are seek new ways to reduce the cost of poultry diets by replacing imported soybean meal or animal-protein meals with local, cheaper feedstuffs. This work should also benefit feed manufacturers who wish to use these legumes more than the current low limit in broiler (5%) and egg layer (7%) diets.

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Monogastrics such as poultry do not have enzymes that enable them to break down and digest the complex cell-wall lattices of lupins. Pectins are important for the integrity of the cell wall and remain largely intact during the digestion process in the intestine. Intact pectins increase the viscosity of digesta and this reduces digestion and absorption of the nutrients. Growth is lowered, food conversion efficiency reduced and both broilers and egg layers increase their water intake which increases wet droppings and soiled eggs.

Pectins can be broken down by the pectinases, polygalacturonase (PG) and pectin methyl esterase (PME). Hence, pectinases have the potential to reduce viscosity and water-holding capacity of dehulled lupins. Ultimately these treatments will improve the metabolisable energy of the diet and lead to increased growth and food conversion efficiency of poultry.

The results show that pectinases can significantly improve the nutritive value and may allow inclusion rates in diets to be lifted from below 7% up to at least 20% in broiler and egg layer diets without compromising the production performance or increasing wet droppings.

Collectively, these improvements should deliver considerable savings in feed costs and, since feed costs are at least 70% of the variable costs of production, this should amount to considerable savings in total costs. Additionally, these improvements will reduce the nutrients excreted into the environment and reduce pollution.