

FINAL REPORT

**EVALUATION OF FABA BEANS AS AN ALTERNATIVE PROTEIN
SOURCE FOR PIGS AND POULTRY**

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Funded by the Protein Research Foundation

December 2007

EXECUTIVE SUMMARY

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South Africa produced approximately 68% of its oilcake requirement in the 2005/2006 season (572 000 vs. 842 000 tons) but this dropped to 59 % the following year, and the estimate for the 2007/2008 season is that local production of oilcake will meet only 51 % of the 150 000 tons estimated to be required by the Balanced Feed Industry (AFMA Chairman's Report). This country is therefore heavily reliant on imported protein sources, and as a result much emphasis has been placed by the Protein Research Foundation on finding alternative protein crops that might be grown successfully in South Africa, which could either replace or be used in part with soybean meal, which forms the bulk (79 %) of protein sources imported into this Country. Faba beans are one such source of protein.

This report consists of an extensive review of the literature pertaining to faba beans both from an agronomic and a nutritional point of view, as well as the reports of three trials that were conducted at the University of KwaZulu-Natal, using broiler chickens, laying hens and weaner pigs. Faba beans were accessed from the Cape and from the Department of Agriculture, Cedara, in Pietermaritzburg, KwaZulu-Natal Province, in the 2005/2006 season and were used unprocessed in all three trials. In all trials, two basal feeds were formulated and mixed, one of which contained no faba bean whilst the other contained a level varying from 200 to 300 g/kg feed. These basal feeds were then blended in appropriate proportions to produce a series of feeds of increasing faba bean content. Performance was measured over a period of time, and the results were subjected to regression analysis, to determine the response of the various species to increasing contents of faba bean. In both the laying hen and the weaner pig trials a choice was offered between the two basal feeds in addition to the response series.

In the laying hen and weaner pig trials there was no difference in performance over the range of faba bean levels used, and the hens and pigs given a choice between the two basal feeds consumed equal amounts of each, indicating that the two feeds were equivalent in nutritional

value, and that the faba bean basal contained no antinutritional factors harmful to, or detectable by them. In the broiler trial, however, where the feeds were offered in a mash form the performance declined significantly as the faba bean content increased, whereas when the feeds were pelleted, performance increased significantly on all feeds but increasingly as the faba bean content increased. This indicated that the beans contained some heat labile factor that was destroyed by the heat generated in the pelleting process, and suggests that it is unnecessary to autoclave faba beans in order to destroy antinutritional factors present in the beans if the complete feed is to be pelleted. It is also evident that broilers are more susceptible to these antinutritional factors than are laying hens or weaning pigs. However, as most broiler feeds are pelleted, it would appear that faba beans could be used successfully in such feeds.

Whereas the majority of faba beans produced around the world are consumed by humans, and generally only the damaged beans are used as a protein source for animals, there is no nutritional reason why faba beans could not be used as an alternative protein source in feeds for broilers, laying hens and growing pigs when geographic, agronomic and economic conditions favour the use of these beans.