Lupins in UK Agriculture & Aquaculture

Ruminant

Executive Summary Results

Evaluation of a Home-Grown Crimped Lupin and Barley Concentrated Feed for Finishing Lambs

Introduction

LUKKA (Lupins in UK Agriculture and Aquaculture) a joint initiative between partners: Alltech, Alvan Blanch, Birchgrove Eggs, Ecomarine, Germinal, Kelvin Cave, NIAB TAG, PGRO, Soya UK, Wynnstay Group PLC, University of Plymouth and IBERS, Aberystwyth University; shows that farmers can reduce their reliance on bought-in soya and other imported proteins by growing and processing lupins on farm. The project was funded by the industry partners and co-funded by Innovate UK, the UK's innovation agency, in collaboration with the Biotechnology and Biological Sciences Research Council.

In a recent experiment conducted at IBERS, Aberystwyth University, the LUKAA project investigated the effects of incorporating crimped lupins as part of a home-grown diet compared to a commercial lamb finisher diet (control) on lamb productivity and carcass characteristics. Earlier research at IBERS had shown that lupin grain can be fed within a pelleted concentrate without adverse effects on lamb productivity. However, as grain-drying facilities are not often available on livestock farms, here the research focus was on lupin grain harvested with high moisture content, crimped, ensiled and treated with an acid-based preservative.

In the experiment, a crop of Boruta narrow-leafed lupins was grown alongside a crop of Propino spring barley. Both crops were sown on 16th April 2013; the barley was harvested at 40% moisture content on 8th August and the lupins at 21% moisture content on 27th August. Both crops were crimped through a Murska crimper, treated with Crimpstore 2000S (barley 3 litres/tonne and lupins 6 litres/tonne) and ensiled on the day of harvest.

For the experiment, 40 castrated male Texel-cross lambs from the same flock, with a mean weight of 32kg, were divided into eight groups of five lambs. Four groups were fed a proprietary lamb finisher pelleted ration with ad lib straw and water, and four groups a mix of 70.5% crimped barley, 27% lupin and 2.5% minerals again with ad lib straw and water. The home-produced ration supplied equal protein and higher energy compared to the pelleted ration and showed a cost saving of 19% over the commercial lamb finisher.

Following a 14-day adaptation period, lambs were weighed every 7 days and group intakes were monitored for a 28 day period. From Day 29, as lambs were selected for slaughter, back fat and muscle depth were measured and carcass data were recorded.
Results, as shown in Table 1, found no differences in the productivity or carcass quality characteristics of lambs offered the crimped lupin / barley concentrate compared to the control diet.

Conclusion

What this study demonstrates is that home-grown crimped lupins can be a viable protein source for UK livestock farmers, with home-grown crimped lupin / barley concentrate diets being used for finishing lambs without any detrimental effects on productivity or carcass characteristics. Lupins also offer the additional benefit of their ability to fix nitrogen, resulting in reduced inputs for following crops. The research project has led to better understanding of the agronomy of lupins in the UK and shows that modern varieties of lupin give more reliable yields and are earlier maturing than those previously available.

Crimping allows earlier harvesting of both crops, supplies valuable barley straw and facilitates early establishment of following crops.

For more information about crimping lupins for finishing lambs contact:

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Table 1

Lamb productivity and carcass characteristics

	Lupin/Barley	Control	standard error of difference	Probability
Live-weight gain (g per day) #	110	159	35.5	ns
Condition score	3.34	3.42	0.079	ns
Weight empty (kg)	34.8	35.0	0.68	ns
Cold carcass weight (kg)	17.0	17.5	0.59	ns
Killing out ratio	0.49	0.50	0.010	ns
Muscle depth (mm)	25.86	26.95	0.530	ns
Back fat depth (mm)	4.7	4.5	0.31	ns

= days 0 to 28; ns, no statistical difference between treatments.

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