



Sustainable Livestock Production LINK Programme

Project LK0682: The environmental consequences of using home-grown legumes as a protein source in pig diets (Green Pig)

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End Date: 01/10/2012



Executive summary report

Background. Sustainable alternatives for soya bean meal (SBM) are needed for the British Pig Industry to remain globally competitive and comply with government policy for sustainable pig farming and reduce environmental impact. Green Pig brought together pulse growers, feed manufacturers and pig producers to investigate the potential of using UK grown peas and faba beans in growing and finishing pig diets to reduce reliance on SBM and associated environmental concerns.

Approach. The Green Pig project used multiple approaches to achieve its overall aim. The environmental benefits of using pea and bean based diets were assessed through life-cycle assessment (LCA) modelling. A survey of compound pig feed producers and home-mixer pig producers aimed to identify the perceived constraints of using peas and beans in pig feed. The amino acid (AA) profiles and digestibility of different varieties of UK grown peas and beans have been assessed. Pea and bean-based pig rations were tested in small scale dose response performance trials, N-balance and carcass evaluation trials, and large scale on farm demonstrations. Derived project data was used to rerun the LCA.

Results. The LCA undertaken indicated that using peas or beans to replace SBM would reduce eutrophication and acidification potential of growing and finishing pigs by ~45% and ~62%, respectively. Their global warming potential would reduce by ~29% when SBM use is associated with recent land use change, though by only by ~4% if SBM is sourced sustainably. Similar benefits may be achieved for organic pigs. A survey amongst feed compound producers and home mixer pig producers confirmed that cost and supply consistencies are the biggest constraints of using peas or beans. Whilst their nutritional value was less of a perceived constraint, perceived maximum inclusion levels are low at ~10%, relative to considerably higher levels used elsewhere. AA composition and digestibility differed little between pulse varieties, though pea AA digestibility was consistently higher than that of beans, whilst anti-nutritional factors, especially in peas, are likely below threshold levels. Experimental trials concluded that grower and finisher pig diets with up to 30% peas

or beans resulted in similar body weight gain, feed intake and food conversion ratio as SBM control diets, without detrimentally affecting N retention, back fat skatole levels and carcass quality (P2 and calculated lean percentage). Four conventional commercial trials confirmed that high pea or bean diets resulted in similar performance, health, cleanliness and slaughter measures as SBM control diets. An inconclusive organic observation that pigs seem to perform similarly on a high pea/bean diet without SBM compared to a standard organic diet is encouraging enough to warrant further investigation. Green Pig outcomes have been disseminated through over 100 knowledge transfer activities.

Conclusion. Green Pig concluded that UK grown peas and beans are viable home-grown alternatives to SBM in nutritionally balanced grower and finisher pig diets. Higher than traditionally considered upper inclusion limits can completely replace SBM without detrimentally affecting growth performance, digestibility and N-balance, and carcass quality whilst reducing environmental impact, especially if SBM replaced is associated with land use change.

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