TRansition paths to sUstainable legume-based systems in Europe

Case Study 4

The use of legumes and leguminous by-products within dairy systems at Crichton Farm

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SRUC

Aim

Determine productivity and environmental impact of dairy products produced by Homegrown and By-product feeding systems containing high production and UK average genotypes of dairy cows.

Progress

A detailed inventory of inputs and outputs required to maintain each of the dairy farming systems is being tabulated annually over four years using a farm gate boundary. This will enable subsequent performance indices such as carbon footprints, and nutrient use efficiencies to be calculated. Data from four herds is extracted either directly from SRUC's Langhill database or obtained from records held by the farm manager.

An inventory of the herds is being prepared via calculation and tabulation of variables arising from dairy system inputs and outputs. Data stems from land use and crops, livestock, energy use, and imports onto the farm. Within the By-product(BP) system all feed components are imported onto the farm either within a blend or individually, whereas for the Home-grown(HG) system all feeds are provided by crops grown, using imported fertilisers and slurry.

Within the BP system leguminous co-products represent 10% of the ration and include soya bean meal. Legumes grown include spring beans, red clover and lucerne (alfalfa) and account for up to 15% of the ration. Figures for BP feed intakes have been compiled monthly using individual cow fresh weight intakes and analysis of TMR's to determine weekly dry matters of the diets. Thrice daily milk yields and associated weekly fat and protein levels have been used to provide averages for milk quality and this data is complete for both BP herds.

Outputs to be reported from the dairy systems

Parameter	Units	
On farm land use	ha	ha /LSU
Off farm land use	ha	ha /LSU
Harvest	tonnes/ha	DM %
Milk yield	litres/cow	litres/ha
Energy corrected milk	kg	kg/cow
Protein & Butterfat	%	
Daily yield	kg / cow	
Dry matter intake	kg / cow	
Live-weight	kg / cow	
Sprays & Fertilisers	kg / ha	litres/ha
Manure management type	% of year	
Purchased feed & bedding	tonnes FW	Dry matter %
Nitrogen & Phosphorus surplus	kg/litre	kg/litre ECM
Carbon footprint	kg CO2 e / kg output	

Forthcoming activity

Land use requirements for each of the genotypes within the Home-grown system will be made over the next reporting period. Crops grown include grass silage red clover, alfalfa, spring beans, wheat alkalage and maize silage.

Monthly dry matter intakes stemming from daily individual cow intakes will be aggregated at herd level and annualised for years 2012 to 2015 inclusive. Data relating to the use of insecticides will be compiled.

Policy Makers | Inputs | **Primary Production** | Aggregation | Processing | Distribution | Retailers | Markets | Consumers

WP1: Knowledge Exchange & Communication | **WP2: Case Studies** | WP3: Nutrition and Product Development | WP4: Markets and Consumer | WP5: Life Cycle Assessments and Environmental Assessments | WP6: Economic Assessments of Legume Production and Consumption | WP7: Policy and Regulations | WP8: Transition and Decision Support Tool

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