## Beef Quality

### Profitable production of bull beef to market specification while ensuring optimum quality for the consumer

This multidisciplinary proposal addresses the Food Harvest 2020 recommendation that "market-led production systems for young bulls from both the beef and dairy herd should be encouraged through enhanced research with clear price incentives that result in animals being finished to market specifications". The over-arching tasks concern the modification of production systems for bull beef to increase profitability and the assessment of the resulting bull beef for market-relevant quality characteristics (see Beef Systems HYPERLINK?). Underpinning research tasks will focus on elements within the pathway from farm to fork that limit achievement of market specifications. The impact of slaughter age, a key requirement of the UK market, on eating quality and its possible interaction with carcass intervention strategies to enhance the eating quality will be examined. Insufficient fat cover is a limitation in several markets so the potential to enhance fat deposition in bulls by nutritional intervention at various phases in the life cycle will be examined. Rumen metabolism and health during transition to high energy finishing rations together with the influence of pre-slaughter ration composition *per se* on fat deposition and meat quality will be examined. A suite of instrumental and sensory measurements, in particular of colour and tenderness will be made. The underlying basis of these traits will be investigated. Deliverables from this project will be 1. Blueprints for farmers for producing bull carcasses of defined weight and classification, 2. Information for the meat industry on the associated quality characteristics of bulls produced in a range of systems and 3. A contribution to a database on bull carcass composition from which a future quality payment system for bulls could be derived.

**Funded by the Irish Department of Agriculture, Food and the Marine.**

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### Nutritional composition, human health implications and marketing opportunities for beef from a grass-based production system

The objectives are to produce and assess beef from grass-based production systems, in the context of quality for the consumer but also consumer nutrition and health. Using an early maturing heifer beef system, beef will be produced from an exclusively grass or grass products (silage)-based diet. This novel beef will be compared with concentrate-finished beef and beef from a grass-silage based finishing system enriched in fatty acid composition by strategic concentrate supplementation. Sensory analysis will be carried out of the striploin. Five individual meat cuts (muscles and adipose tissue) will be collected from each animal at slaughter for analysis of a range of constituents considered to have human health benefits, in particular fatty acids and target micronutrients. Colleagues in University College Dublin will assess the impact of level of consumption of these nutrients on blood markers of human health will be modelled using data within the National Adult Nutrition Survey database. The health effects of feeding grass-fed beef on markers of diabetes and heart disease will be determined in animal models and in an acute intervention/metabolic challenge study in human volunteers. Marketing opportunities and challenges to capture the benefits of grass-fed beef will be examined using a stakeholder workshop format.

New information will be provided on:

1. The sensory characteristics of grass-fed and concentrate-fed beef.
2. The composition of beef from grass-based production systems for inclusion in food composition databases.
3. Data on the comparative effects of different types of beef on human health from animal and human studies.
4. Strategies to assist the marketing of Irish beef.

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