



Heavier carcass weights and pork quality : performance testing of purebred pigs from the Canadian Swine Improvement Program



Summary

Pork continues to be the world's most-eaten meat, with consumption continuing to grow. Canada is well positioned as a major pork exporter in a highly competitive global community, as Canadian pork is lean, high yielding and carries a reputation for wholesomeness and freedom from residues. However, challenges are emerging with new requirements in both domestic and international markets, regarding meat safety and quality standards. Pork quality is an important issue in this area. A recent market survey ("Québec Market Reference") made by Centre de Développement du Porc du Québec (Levesque 2004) has shown the growing requirements for heavier hog carcasses expressed by several segments of the pork value chain, as well as the need for limited leanness, uniformity and enhanced meat quality. Moreover, in 2003 CCSI co-organized, with CPC and CMC, a consultation forum on pork quality, where the needs for a common vision and strategy on pork quality improvement were expressed by all different levels of the industry.

For decades, pigs have been selected for higher growth rate and leanness. Other traits of economic importance, such as feed efficiency and litter size, were successively added to selection programs. There is a growing need for pork quality in many domestic and foreign markets, especially in US and Japan. There is also evidence that meat quality is partially determined by genetics, and that several meat quality traits are correlated, sometimes unfavourably, with traits under selection. Thus, meat quality traits should be included in selection programs in order to be monitored and improved. This requires some exploratory work to characterize meat quality, standardize its recording, and analyze its relationship with other traits of interest, in a context where average carcass weights are increasing. Canadian commercial hogs are usually crossbred animals, produced using at least two steps of crossbreeding, through a pyramidal and multiplicative production scheme.

A previous test performed at Deschambault station (test#15) aimed at analyzing carcass and meat quality traits and muscle characteristics (composition, metabolism, muscle fibres characteristics) in crossbred pigs. This project, carried out by Centre de Développement du Porc du Québec and Food Development and Research Centre in Saint-Hyacinthe, showed this importance of further work on purebred populations in order to better understand mechanisms underlying meat quality and to be able to develop selection tools useful in the Canadian Swine Improvement Program.

This project was designed to bring updated information on purebred pig performance, in order to assess parameters used in the Canadian Swine Improvement Program, but also to work on standardized methods of recording for carcass traits, meat quality and conformation.

The main objectives of the project are :

- to compare pork quality attributes with the current and heavier carcass weights
- to estimate required parameters for selection at heavier weights
- to estimate the value of live measurements to predict meat quality and their interest in selection
- to develop models and procedures for genetic evaluation and selection for producing desired meat quality at higher carcass weight
- to explore the relationships among a large number of traits including growth, feed efficiency, carcass and meat quality, conformation.
- to provide a portrait of each breed for muscle metabolism and fibres characteristics, in order to understand mechanisms dealing with meat quality.

The project will provide:

- estimation of the effect of higher slaughter weights on meat quality, leanness, growth rate, feed efficiency
- detailed portrait of purebred pigs for muscle fibres analysis, muscle metabolism and composition, in relation to classical meat quality traits
- update of parameters used in the national genetic evaluation program, thanks to repeated measurements during animal testing
- standard methods for meat quality measurements
- complete analysis of relationships among many different traits of interest : growth, feed efficiency, carcass quality, meat quality, conformation, etc
- program and procedures for carcass and meat quality data collection
- recommendations for optimal use of carcass and meat quality information in selection programs, in order to address emerging market needs.

This project is quite unique and innovative and deals with several aspects of pig production that are relevant for all industry. First of all, the Canadian Swine Improvement Program will get more efficiency from parameters provided by the project. Secondly, it will provide innovative selection tools and methods for improving pork quality, and knowledge about the mechanisms behind meat quality and its relationships with other traits, at the classical carcass weight and at heavier weights. The various segments in the swine industry will benefit from the improved genetics to meet the market requirements and consumer demands for superior quality pork. The Canadians will therefore benefit from good quality pork that can be offered at a competitive price