DESIGNING PRECISION LIVESTOCK FARMING TECHNOLOGY TO SUPPORT A FUTURE OF SUSTAINABLE PIG PRODUCTION

Tomás Norton and Daniel Berckmans
Division M3-BIORES:
Measure, Model & Manage Bioresponses,
Catholic University Leuven, Kasteelpark Arenberg 30,
3001 Heverlee, Belgium

E-mail: tomas.norton@kuleuven.be

1. Introduction

Pig meat is a globally important protein source. In the EU-28 pig meat represents 55% of the total 40 Mt of meat produced each year. EU pig production has traditionally been based around small-scale family farming, and what was grown on the farm was used to feed the family and local community. In recent years however, the EU has being going through a period of consolidation, with the number of farms steadily decreasing, while the agricultural area remains stationary and economic output increases (EC, 2013). The result is that the process of livestock production is changing in the EU, farmers need to exploit economies of scale by increasing animal numbers to dilute the fixed costs and buffer against volatility in the meat, feed and energy markets. A key question now is how can farmers manage their ever-growing production systems to achieve high-quality, sustainable and safe meat production that can meet this demand. Recent studies have indicated that achieving scale-dependent benefits in agriculture requires new production technologies (Sheng *et al.* 2015).

A key challenge facing farmers is how monitoring the health and well-being of the animals changes with increasing farm size. Previously farmers monitored the animals by observing and interacting with individuals, and made farming decisions based on experience and historical knowledge about the particular animals. However, such a direct relationship may be difficult to build in modern large-scale production facilities due to the number of animals in the herd (Berckmans, 2004). Precision Livestock Farming (PLF) is a modern approach to farm livestock production using technologies for automatic monitoring and control of processes typically done manually in the past (Berckmans, 2014). PLF systems aim to offer to the farmer a real time monitoring and management system based upon the continuous monitoring of the animals using modern ICT and sensor systems. Continuous, fully automated monitoring and improvement of animal health, welfare, productivity and the environmental impact