The Impact of Feed Formulation and Feeding Methods on Pig and Poultry Production on the Environment. Candido Pomar¹, Aline Remus¹, ¹Agriculture and Agri-Food Canada

Abstract: Dietary energy and nutrient losses associated with its conversion into animal products increase production costs and contribute to the environmental footprint of farms with the excessive application of nitrogen, phosphorus, or trace minerals from manure or carbon and methane losses. Formulating diets with the appropriate levels of minerals and amino acids can help improve dietary protein and energy efficiency and reduce nutrient losses. For example, an 8% reduction in dietary crude protein in pig feeds is estimated to increase nitrogen efficiency by more than 50%, while costing 11% less than a control diet without industrial amino acids. This reduction in protein intake also increases energy availability due to reduced energy losses associated with protein deamination. Urinary and intestinal fermentation energy losses can be 24% lower for pigs fed low-protein diets compared to control diets. Nonetheless, determining the optimal level of dietary amino acid remains a difficult challenge in conventional phase feeding systems. Therefore, group or individual precision feeding is another powerful tool to increase nutrient efficiency. By feeding individual growing-finishing pigs with diets tailored to their requirements, precision feeding can decrease nitrogen excretion by 30% and greenhouse gas emissions by 22% compared to conventional 3-phase feeding. The benefits of feeding pigs with low-protein diets and precision feeding techniques are additive and might result in a 61% protein efficiency of utilization. The formulation of very-low-protein diets and the implementation of precision feeding techniques rely on sound nutritional concepts and comprehensive biological models developed to precisely estimate individual real-time nutrient requirements and animal responses. Understanding the metabolic processes responsible for the observed variation between individual animals in their ability to utilize dietary nutrients is challenging, but there is a need to further improve nutrient efficiency and reduce the environmental impact of livestock production systems.

Keywords: sustainable pig and poultry production, low protein diets, precision feeding

Preparing for a low Zinc World a new Paradigm for Feeding Piglet. Gilles Langeoire¹, ¹Gilles Langeoire Consulting

Abstract: Since many years in Western Europe a general trend pushes the consumers demand toward a meat production clear from antibacterial residue. A ban of antibiotic as animal growth promoter started in 2006. Developed in Denmark then in many other pig producing countries, the use of high level of zinc oxide was considered as the solution to limit antibiotics and efficient against the post weaning diarrheas. In France and in the Netherlands, very quickly the most negative consequence of the excreted zinc on the environment and later to the outbreak of antibiotic-resistant bacteria leaded to a ban of these therapeutic level of zinc oxide. In June 2017 the EU commission, decided to ban the high level of zinc oxide in the piglet feed at weaning; the European pig producers had 5 years moratorium to apply that new regulation. Next June 2022, the European producers will have to change of paradigm: To wean piglets with limited antibiotics and zero zinc! That new approach needs to be holistic, combining the piglet breeding and the feeding management. From our experience, some points are of real importance: Mind the feed intake: before and during weaning, Improve the nutrients’ digestibility: a highly digestible protein level can limit the risk of proteolytic fermentations and limit the risk of PWD, Increase the acidification of the diet: A Low pH and a low ABC4 will lead to a better organic acid efficiency, a better protein digestibility and a lower risk of digestive dysbiosis, Taking advantage of the dietary fibre’s fermentation: an optimal level of dietary fibre will improve the gut morphology and through the NSP fermentations will improve the microbiota and the gut health status. These recommendations will finally lead to better feed performance: Higher feed intake and better piglet growth by maintaining the eubiosis around weaning through the settlement of an optimal, stable and diversified microflora.

Keywords: zinc oxide ban, piglet nutrition, low zinc