



Optimizing piglet performance through appetite stimulation and gut health



MATHILDE RAMILLIEN* presents a solution to improve the performance of piglets by stimulating their appetite, while taking care of their intestinal health.

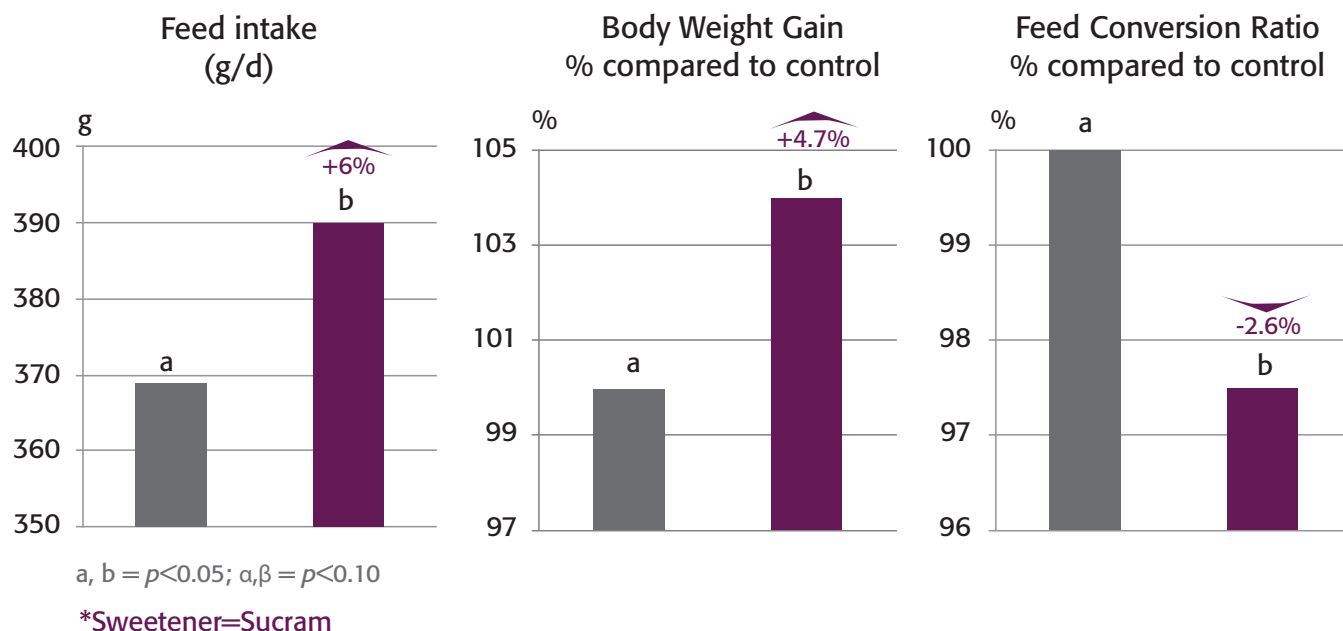
Mode of action of taste enhancers

Commonly used in feed to enhance appetite by providing an attractive taste, their function is to target the receptors of the 5 main tastes, namely: sweet, salty, bitter, acid and umami. Many tests and studies have demonstrated the positive effect on the condition of animals and consequently improved performances.

It is known that a good taste enhancer improves the taste of feed and stimulate consumption. However, some molecules, such as monosodium glutamate (umami taste), present in some product, are known to trigger a hormonal secretion (cholecystokinin (CCK) hormones) reducing animals' appetite. Sweet flavor enhancers, such as Sucram products, do not contain them.

These sweeteners trigger the sweet taste receptors (T1R2 and T1R3) mainly known to be located on the tongue of animals, as well as humans. Nevertheless, they have also been

Figure 1: Field trial results of piglets fed a sweetener* product versus control diet.



identified in the digestive tract where they play a very important role.

The main interests are the molecular physiology and effects of the products at gut level. This process includes gut sensing, gut immunity and gut microbiota. It is what is defining 'gut effects' and is promoted as 'Intelligent Gut Action' (IGA). This phenomenon that occurs at the intestinal level has two main effects: the release of glucagon-like peptide 2 (GLP-2) and thus the secretion of the glucose transporter (SGLT-1). The GLP-2 hormone is involved in tissue repair and increases blood flow to the gut, which can improve digestion and absorption of nutrients in addition to preventing or repairing damage. Thus the release of SGLT-1 will promote glucose uptake.

Therefore, the use of a high intensity sweetener improves the integrity of the animal's gut and the absorption of nutrients.

As this type of additive is usually incorporated at low doses, it is essential that its quality and technology ensure a good mixability and even dispersion in feed. Therefore, the technical constraints are crucial for an optimum effect: homogeneity, flowability, particle size distribution.

Improved piglet performance

Besides good quality feed, favorable housing conditions, climate and farm management a fast gut development and a good gut health are key parameters in the growing process of animals. To maximize this development from the earliest stages of the animals' life, the diet should be attractive and palatable. A sweetened feed is more likely to be accepted by young animals when solid feeds are offered to them for the first time.

Once the feed is ingested, Sucram will first be detected by receptors on the tongue and will give the feed a pleasant taste. Then it will be able to achieve its effects on the gut.

Independent field trials of 384 weaned pigs revealed that the sweetening product increased feed consumption (+ 6%), body weight gain (+ 4.7%), and improved feed conversion ratio (-2.6%) (Figure 1).

Increased *Lactobacilli*

More recent trials have indicated that Sucram also has an impact on the *Lactobacillus* population. This is the first report of a prebiotic like effect of Sucram influencing commensal gut microbiota.

Sweetener applications and quality

Sweeteners can be used in a wide range of applications for many types of feed, such as creep feed, pre-starter, starter, milk replacer, drinking water and for several species including piglets, pigs and sows, as well as calves, beef and dairy cows. Formulations must be properly selected according to the targeted specie and local legislation. For example, a sweetener used for sows in Europe cannot be based on sodium saccharin. To fit these needs the Sucram portfolio also contains products based on natural sweeteners. Research projects to understand the specificities of sweet taste receptors in swine are ongoing.

In addition to sweet taste receptors the gut also has the ability to detect other taste compounds (umami and bitter) non-nutrients such as phytonutrients, including capsaicin (from chili peppers) and cinnamaldehyde (from cinnamon).

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