PROGRAM NEONATE

Boosting piglet quality at weaning with sow precision nutrition

Phileo by Lesaffre

Summary

To meet ever-growing demand of pork, the swine farming industry is facing numerous challenges, including increasing economic pressures, animal welfare standards, and environmental sustainability concerns. Key zootechnical challenges in the maternity stage encompass managing hyperprolific sows, optimising feed efficiency, ensuring robust piglet growth and health, and optimizing sow longevity and lifetime performance.

Establishing a balanced gut microbiota can be a strong success factor for both sows and piglets. Indeed, the gut microbiota of sows during gestation and lactation helps shape better health and nutritional status of both sows and piglets, directly impacting their performance and development.

Supplementation with the yeast probiotic Actisaf® Sc47 has proven to be effective in enhancing gut microbiota of sows, thereby improving nutrient absorption, reducing constipation, and boosting the nutritional and immunological properties of colostrum and milk provided to piglets. In addition, microbiota transfer is positively modulated, thus contributing to increased weaning weights, as well as reduced incidence of diarrhoea and mortality in the newborn piglets, and increased litter size at weaning. Finally, yeast probiotic supplementation also helps maintain sows' body condition during lactation, which safeguards subsequent reproductive performance and contributes to enhanced longevity and lifetime productivity. Ultimately these benefits ensure greater economic and environmental sustainability for swine farming operations.

Program Neonate

Program Neonate: boosting piglet quality at weaning with sow precision nutrition

To meet the global demand for pork and face current economic, regulatory, and sustainability challenges, the swine farming industry has successfully and sustainably increased its productivity. To achieve this, farmers have been breeding hyperprolific sows due to their ability to produce a higher number of piglets per litter. Nevertheless, this shift presents challenges related to higher nutritional demands for sows with limited feed intake and the need to ensure the survival of smaller and more fragile piglets (Figure 1).

In this scenario, sow farmers must adopt advanced nutritional and health management solutions to maximize performance while upholding high standards of animal welfare and health. Through well-balanced nutrition, farmers can manage the sow's gut microbiota profile, which is crucial for improving and maintaining both sow and piglet health, as well as their zootechnical performance, especially towards the end of gestation and during lactation. It also significantly enhances the nutritional and immunological profile of colostrum and milk, resulting in better-quality piglets.

Answering to the global pork demand

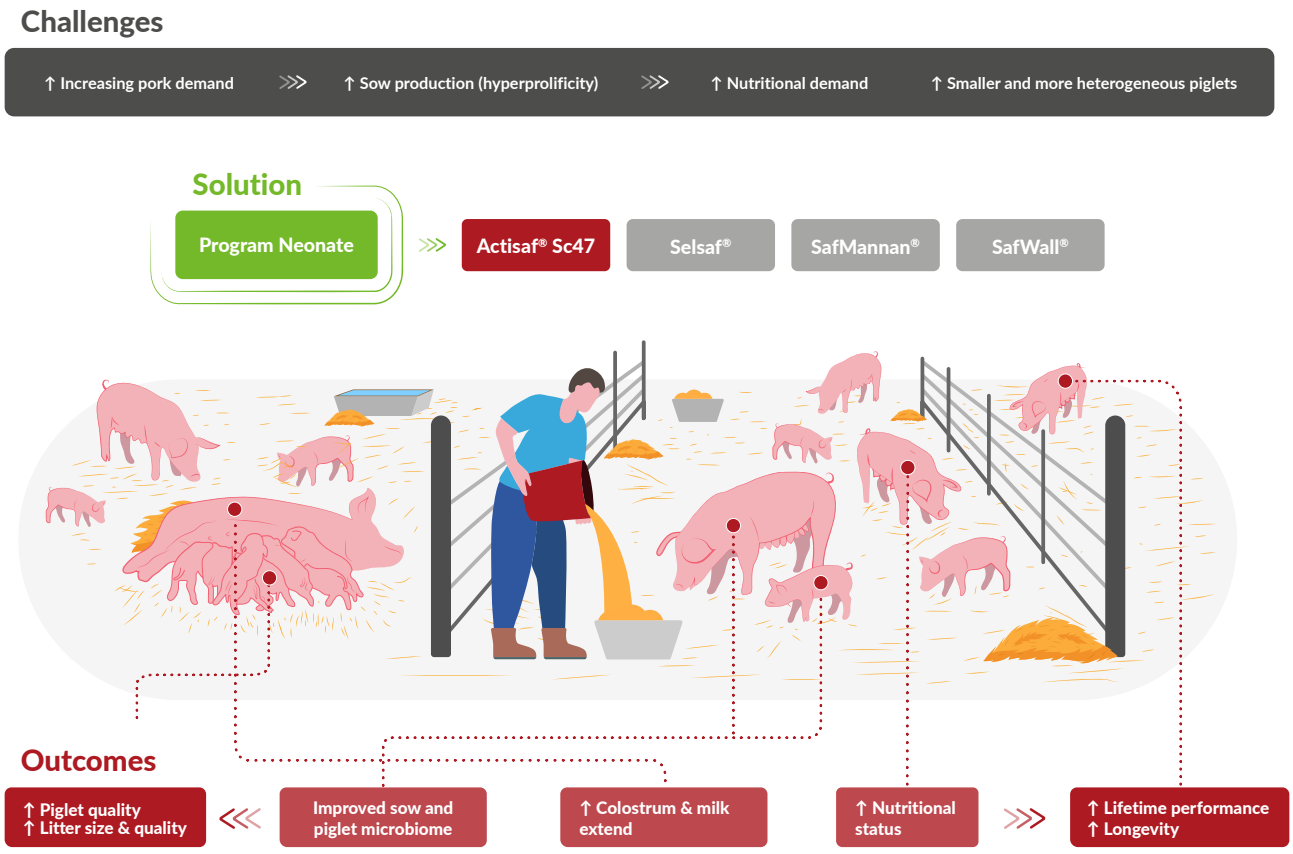

Figure 1. Overview of current critical challenges in swine production.

Incorporating specific nutritional approaches can be a highly effective way to achieve these goals. One such approach is Phileo's Neonate Program, a nutritional program encompassing the reference yeast probiotic Actisaf® Sc47, a proprietary strain of *Saccharomyces cerevisiae*, which has been selected for its resilience to the feed pelleting process and to the harsh conditions of the gastrointestinal tract.

This white book explores how the yeast probiotic Actisaf® Sc47 provided to pregnant sows at the end of gestation and during lactation promotes the establishment of a balanced microbiota profile in both sows and piglets. In the sows, this translates into a healthier microbiota and a better nutritional status, both of which result in a significant improvement in the piglet microbiota, the quality of colostrum and milk from the sow, as well as the ability to produce an abundant amount of milk to feed large litters. The sows also suffer less during lactation and their body condition is less affected at weaning. This ultimately promotes a better health status at the beginning of the next cycle, helping maintain or even improve their lifetime performance and longevity. Finally, a swine herd with a better intestinal health contributes to improved performance and sustainability of pig farming.

Yeast probiotics

ActiSaf

Active ingredients

SelSaf

Yeast fractions

SafMannan

SafWall

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1. Gut microbiota: the foundation of sow and piglet health

The piglet gut microbiota is shaped by the sow gut microbiota

The gut microbiota, a complex community of microorganisms residing in the gastrointestinal tract, plays a vital role in pig health. Ensuring a balanced microbial community, populated with beneficial bacteria in sows is essential for the health and proper development of piglets (Figure 2).
A well-balanced and resilient gut microbiota profile is crucial for pigs at all life stages—from piglets to sows—as it affects key physiological processes, such as digestion and absorption of nutrients, and immune system development[1,2].

Before birth, the piglet gut is sterile, and the transfer of microbiota from sows to piglets begins during farrowing, as piglets first come in contact with the sow's vaginal and faecal microbiota[3]. The influence of the sow on a piglet's microbiota continues up to weaning, as sow gut bacteria are transferred to the piglets through colostrum and milk. This transfer occurs due to the migration of bacteria from the sow's gut to her mammary glands[4].

In piglets, the modulation of microbiota persists long after weaning, a process known as maternal imprinting, and contributes to enhanced health and performance during the nursery period.

The sow's microbiota is shaping the piglet's microbiota

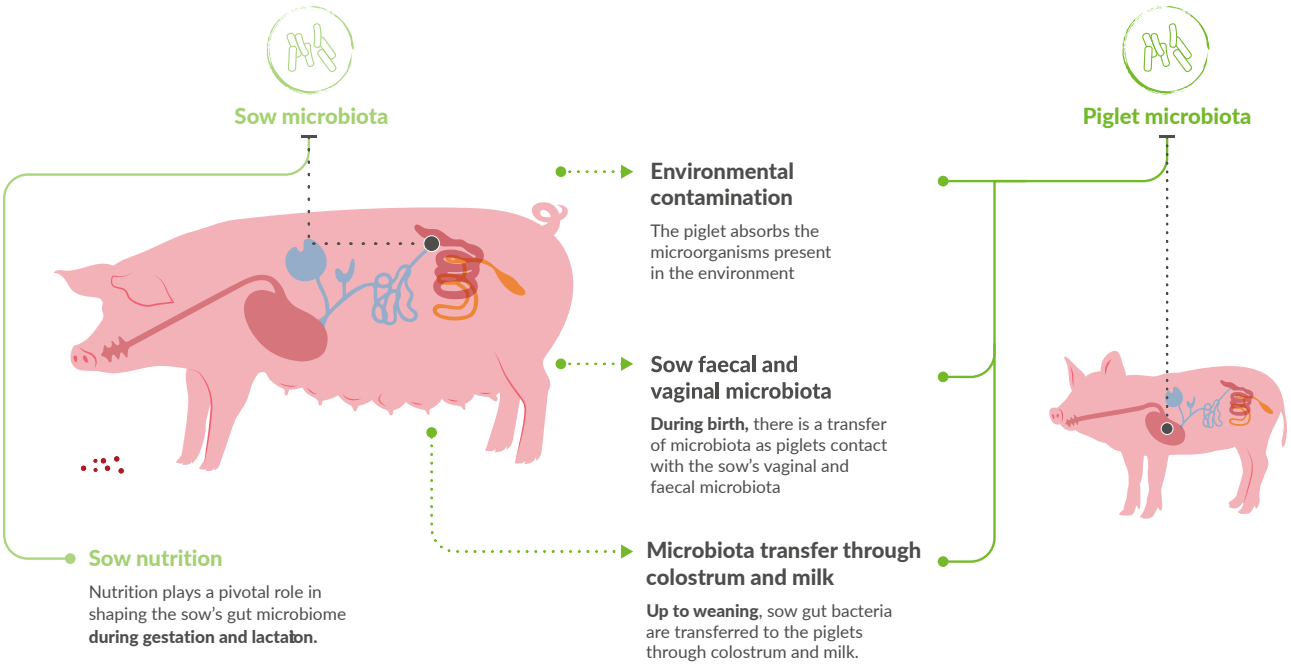


Figure 2. The journey of microbiota: from sow to piglet.

Building a healthier and performing microbiota in sows and piglets

Actisaf® Sc47 supplementation supports the development of a beneficial microbial environment in sows, consequently promoting a better microbiota transfer to piglets. A trial assessing the effect of Actisaf® Sc47 supplementation in sows during gestation and lactation on the microbial composition of piglets using culture techniques has revealed a significant transfer of beneficial microbiota to piglets, coupled with a reduction in pathogenic bacteria (Figure 3)[5].

The study showed that sows supplemented from day 76 of gestation up until 28 days after weaning had a healthier, more balanced microbial community. This beneficial shift extended to their suckling piglets, who also displayed a healthier microbiota profile with an increase in beneficial bacteria such as *Eubacteria* and a reduction in the proportion of harmful bacteria (*Streptococci*, *Enterobacteria*, *Clostridia*) when compared with suckling piglets from the control group. Moreover, sows were capable of transferring the yeast probiotic Actisaf® Sc47 to their offspring, which added to the positive influence on the piglet microbiota as well.

Seeding piglets with the beneficial microbiota

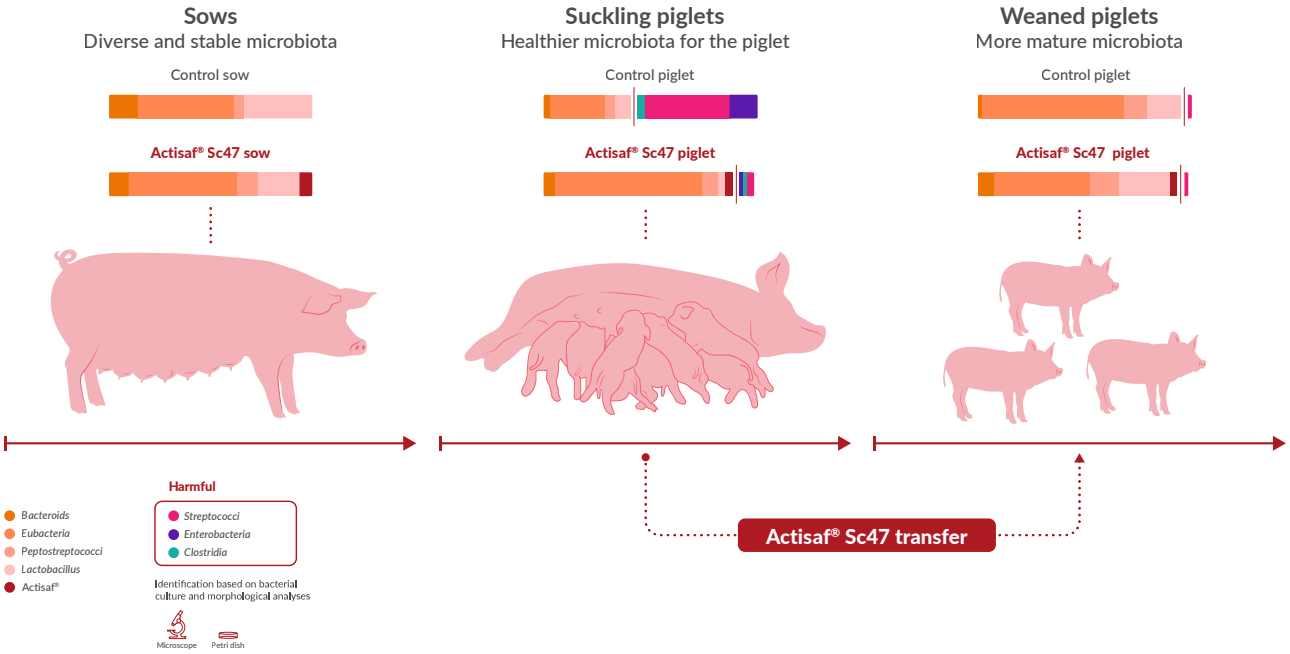


Figure 3. Effect of Actisaf® Sc47 supplementation in sow diet on the microbial composition of sows and their offspring (at 3 kg/ton of feed)[5].

Studies using 16S rRNA gene sequencing techniques also showed that the yeast probiotic Actisaf® Sc47 supplementation promotes in young pigs the development of beneficial bacteria, particularly bacteria from the *Actinobacteria* phylum, notably including the *Colinsella* genus[6,7]. In addition, it was reported that the *Bifidobacterium* genus and *Ruminococcaceae* family were increased. All these bacteria positively influence gut homeostasis.

Besides the promotion of beneficial bacteria, the yeast probiotic was also shown to shape a more harmonious microbial environment where bacteria are more likely to cooperate with each other rather than compete, thereby promoting stability among bacterial communities[6].

Taken together, these studies highlighted the role of Actisaf® Sc47 in promoting gut health, thereby contributing to healthier and more resilient piglets.

Improving energy efficiency in sows with Actisaf® Sc47

Boosting energy and nutrient supply in sows' diets during gestation and lactation is essential for supporting the growth of the fetuses, the development of mammary glands before farrowing, and the production of an abundant amount of milk for suckling piglets[8]. The microbiota in the gastrointestinal tract plays a crucial role in the energy efficiency and nutrient supply in sows, aiding in the breakdown and fermentation of dietary components. This fermentation process produces short-chain fatty acids (SCFA) such as acetate, propionate, and butyrate, which are important sources of energy for the sow and the microbiota. In addition, the microbiota also modulates nutrient absorption by increasing the surface area of the gut lining, which leads to better nutrient utilization from the feed.

The improved gut microbiota associated with the supplementation of sow diets with Actisaf® Sc47 promotes better fermentation of dietary fibre in the hindgut, thereby leading to an increased energy value of feed ingredients. During lactation, Actisaf® Sc47 supplementation increases SCFA production by up to 28% for common feed ingredients, such as wheat, barley, and soybean meal (Figure 4). This increased SCFA production not only provides more energy to the sows but also supports microbiota homeostasis[9], which enhances the growth of the fetuses and the overall reproductive performance of the sows[10].

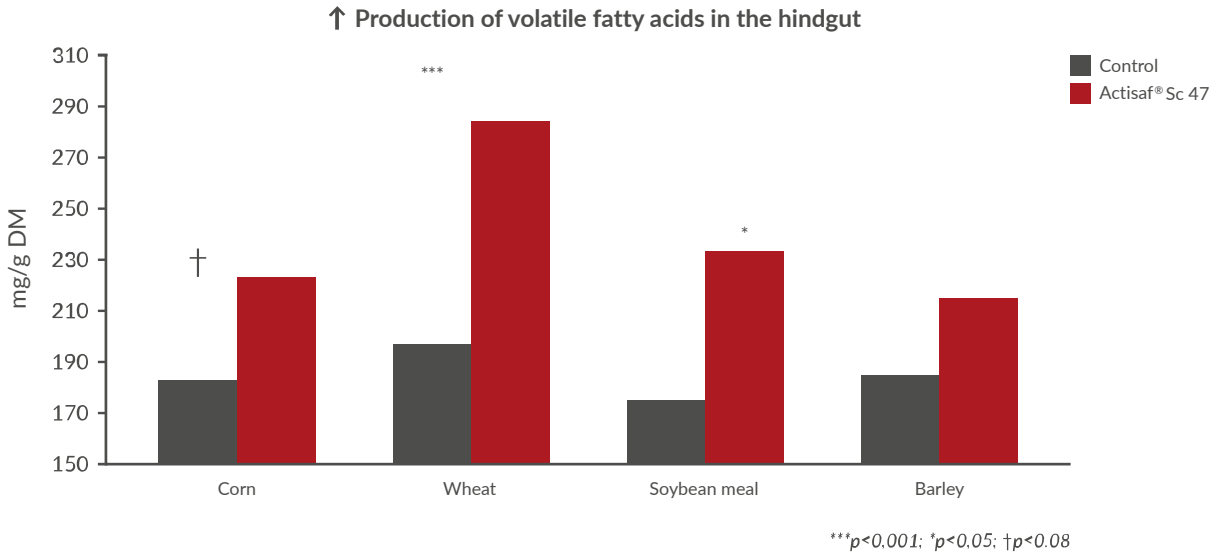


Figure 4. Effect of Actisaf® Sc47 on the accumulation of volatile fatty acids produced by the fermentation of different raw materials by microbial communities isolated from pig's faeces[10].

2. Giving the best start in life with enhanced colostrum transfer

Colostrum, the early lifeline of newborn piglets

Colostrum, the first secretion produced by sows immediately after farrowing, is crucial for piglet survival, growth, and immune development. It provides essential energy, nutrients, immunoglobulins, other bioactive components, and maternal immune cells (Figure 5). In particular, it contains vital immunoglobulins, primarily immunoglobulins G (IgG)[11], which piglets must absorb during the first 24-36 hours of life before the gut loses its capacity to absorb them. The immunity gained from these immunoglobulins is critical for short-term protection against pathogens, as piglets are born with a non-matured immune system that cannot produce antibodies fast enough immediately after birth.

Besides immuno-protective components, colostrum also contains high levels of nutrients, such as proteins, fats, and lactose. The lactose and fat content of colostrum are particularly important, as they help piglets maintain body temperature. Colostrum quality is also critical for piglets because they have very limited energy reserves in glycogen depots in the liver and muscle tissues immediately after birth. These depots are sufficient for normal activity for only approximately 16 hours[12], so piglets may not survive if not rapidly fed with good-quality colostrum.

Colostrum is the primary source of sustenance for piglets

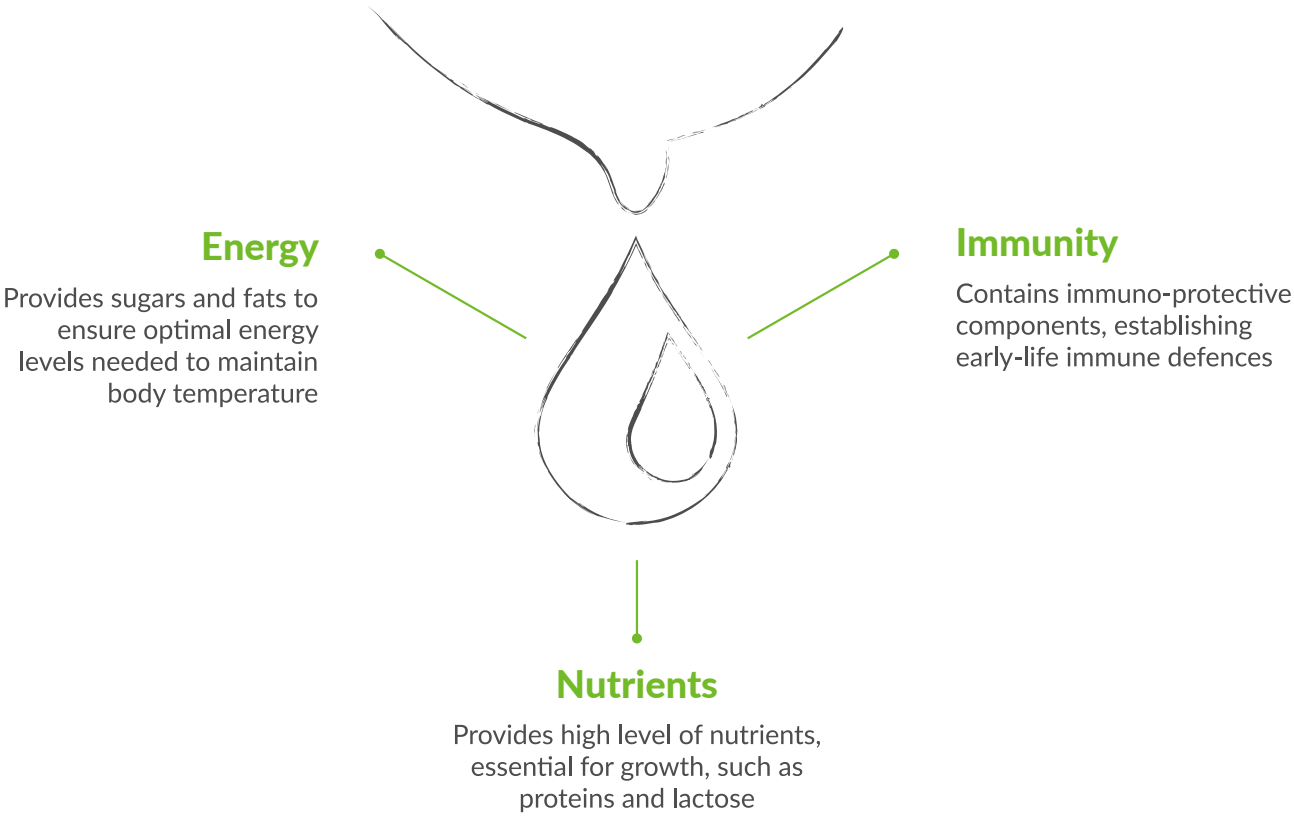


Figure 5. The role of colostrum in piglet health and development.

Giving an adequate share of colostrum

Piglet survival especially during the first 3 days following birth is a major challenge and is directly related to insufficient colostrum intake[13]. This neonatal mortality issue has been reinforced as a welfare concern due to the higher production of hyperprolific breeds. Indeed, the increase in litter size has not been followed by an increase in the capacity to supply large quantities of colostrum and has led to more competition for colostrum among littermates.

In addition, colostrum quality is variable in composition, with high IgG levels maintained only for few hours, adding to the difficulty of providing all piglets with an adequate supply of good-quality colostrum. Finally, hyperprolific breeds also tend to give birth to smaller piglets with smaller reserves, making colostrum intake even more critical for survival.

Piglet vitality: a key factor influencing colostrum intake

Since access to colostrum is more than ever a fight for life, piglet vitality plays a crucial role in their ability to suckle a fair share of colostrum. Larger litters with smaller piglets are an aggravating circumstance since they are associated with reduced vitality at birth due to longer farrowing duration and a higher risk of hypoxia[14]. Nutritional solutions focusing on the reduction of farrowing duration by reducing constipation can help enhance piglet vitality and colostrum intake. Indeed, a shorter farrowing duration reduces the stress and exhaustion in piglets, lowering the risk of hypoxia and enabling them to be more vigorous and active at birth[15]. This increased vitality allows piglets to more effectively compete for and consume colostrum, ensuring they receive essential nutrients and immunoglobulins during the critical early hours of life[16]. Interestingly, constipation can also be linked to post-partum dysgalactia syndrome, a condition associated with the reduced capacity of the mammary gland to produce sufficient quantity of milk[17].

Supporting the energy balance of the sow during the birth of a large litter can also help decrease farrowing time and consequently increase piglet vitality.

Ultimately, a healthy sow with optimal gut health is more likely to produce robust piglets with strong suckling abilities, leading to better colostrum intake and improved outcomes for the entire litter.

The power of yeast probiotic Actisaf® Sc47 to improve colostrum intake

Enhancing the transfer of immunoglobulins

Supplementing sow diets with the yeast probiotic Actisaf® Sc47 from day 90 of gestation through to weaning produces colostrum with significantly higher IgG concentrations. Jang and colleagues reported an increase of 133% compared to non-supplemented sows[18]. This improved immunological quality of colostrum ensures higher and longer-lasting systemic immunity levels in piglets, evidenced by a 161% and 108% increase in Ig levels in piglets at 1 day and 21 days of age, respectively (Figure 6)[18]. These results highlight how the yeast probiotic Actisaf® Sc47 ensures that piglets receive the critical immunity they need right from the start, through improved colostrum quality and enhanced immunoglobulin transfer. This boosts their chances of survival and healthy development.

Improving the nutritional profile

Besides enhancing immunity, yeast supplementation with Actisaf® Sc47 also improves the overall nutritional profile of colostrum. Sows supplemented with Actisaf® Sc47 produce colostrum with markedly higher levels of vital nutrients. For instance, the solid content of colostrum can be boosted by over 25%, lactose by 23%, and protein and fat levels increase by nearly 25% and 6%, respectively[19]. This richer nutrient profile of colostrum provides piglets with a highly nutritious first meal, essential for their energy metabolism, growth, and thermoregulation.

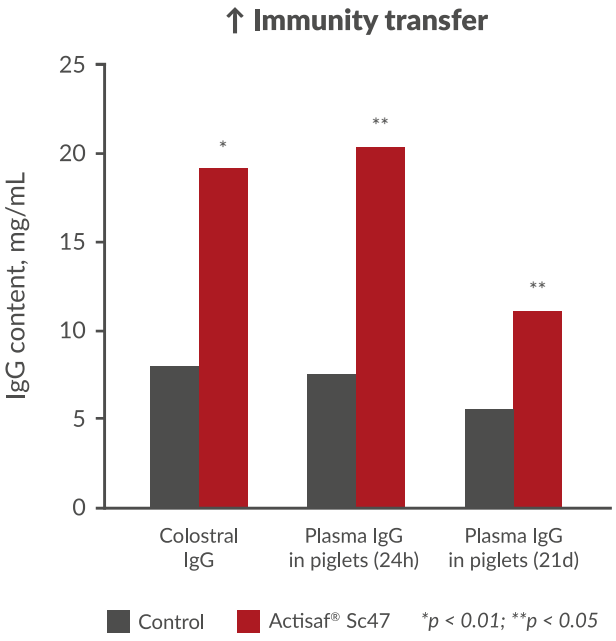


Figure 6. Effect of Actisaf® Sc47 supplementation in sow diets during the end of gestation and lactation on immunological parameters of colostrum and piglet serum[18].

Reducing constipation with Phileo's yeast probiotic

Supplementation of sows' diets with yeast probiotics can have a direct effect on the alleviation of constipation. In a field experiment, a group of 96 sows received a standard dose of Phileo's yeast probiotic from day 85 of gestation in the gestating unit, combined with a transition diet with an extra high dose of yeast probiotic.

The supplementation showed a reduction of 28% in the time to defecate after farrowing (50 hours compared to 70 hours in non-supplemented sows), indicating improved gut motility and overall digestive health. This translated into better piglet health, notably illustrated by a reduction in stillbirths by 41% (from 7.43% to 4.60%)[20].

3. Milk: the fuel for piglet growth and gut resilience

High-quality milk: the key to thriving piglets

Milk quality during lactation plays a pivotal role in the continued growth and development of piglets in the post-colostrum phase. Milk from sows provides essential nutrients and immunological protection to piglets during the lactation period. The essential nutritional elements of milk are similar to those in colostrum (proteins, fats, and lactose).

However, immunoglobulin A (IgA) levels are particularly abundant in milk compared to colostrum. IgA plays an important role in local protection against gastrointestinal pathogens, helping to prevent diarrheal diseases, a common problem in piglets[21].

Unlocking superior milk production for piglets: the Actisaf® Sc47 difference in sow nutrition

Improving lactational immunity and reducing diarrhoea incidence

Actisaf® Sc47 boosts IgA levels in milk, which helps protect piglets from digestive infections. Sows fed Actisaf® Sc47 from day 86 of gestation to the end of lactation were reported to produce milk with significantly higher IgA levels. IgA levels in colostrum increased by nearly 30%, and in milk at day 18, by over 100%[22]. This boosted and long-lasting level of IgA provides piglets with stronger immunity against gut infections as long as they have access to maternal milk. This, along with a microbiota positively influenced by sow supplementation, promotes overall improved piglet health.

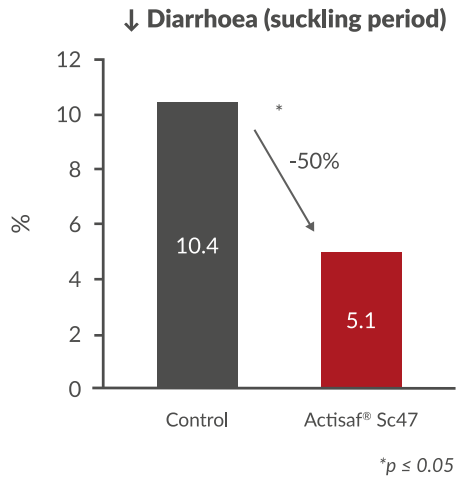


Figure 7. Effect of Actisaf® Sc47 on diarrhoea prevalence in suckling piglets. Supplementation was performed for 2 weeks pre-farrowing and during the whole lactation period, 1kg/t feed[23].

Diarrhoea during the suckling period poses significant challenges in piglets, impacting their health, growth, and survival rates. This condition, often caused by inadequate immunity and poor gut health, leads to severe dehydration, nutrient loss, and increased vulnerability to infections. Consequently, diarrhoea can result in high mortality rates and stunted growth among affected piglets, translating to substantial economic losses for pig producers. Addressing diarrhoea through effective nutritional interventions is critical for improving piglet resilience, enhancing overall herd health, and ensuring sustainable and profitable swine production.

Actisaf® Sc47 supplementation has been shown to lead to a notable reduction of 50% in the incidence of diarrhoea among piglets during the suckling period[23] (Figure 7). This outstanding improvement in diarrhoea alleviation recalls the effectiveness of Actisaf® Sc47 in enhancing the overall health and resilience of piglets.

Feeding more piglets with more milk with better composition

Actisaf® Sc47 also significantly enhances the nutritional quality of sow milk by increasing protein and fat levels by nearly 8% and 14%, respectively[24] (Figure 8), providing piglets with higher-quality milk. An increase in protein and other essential nutrients directly supports the growth and development of piglets by providing the necessary building blocks for muscle development and cellular function, leading to stronger and healthier animals. Next to this, better nutrient intake during lactation leads also to stronger gut health, a more developed immune system, and overall greater vitality.

Furthermore, by estimating the quantity of milk produced by sows based on suckling piglet growth performance, it was possible to confirm that milk production from sows supplemented with the yeast probiotic Actisaf® Sc47 could be boosted by 14%, increasing from 9.2 kg milk/day to 10.5 kg/day[25]. The number of piglets stimulating the mammary gland during lactation is one of the most important determinants of milk production. The higher the suckling stimulation, the higher the milk production.

This is made possible because sows prioritize energy and nutrient utilization towards lactation at the expense of their reserves. In this latter study, the increased milk production with Actisaf® Sc47 supplementation was indeed driven by the higher demand of larger litters. However, it was achieved concomitantly with a better-preserved sow body condition. Indeed, lower backfat losses and lower bodyweight losses were observed in this study, thus indicating a lower catabolic status of sows despite the larger amount of milk produced.

Overall, the improvement in colostrum and milk quality ensures that piglets receive nutrient-rich milk and colostrum, vital for their health and growth (Figure 8).

Boosting the extend of colostrum and milk

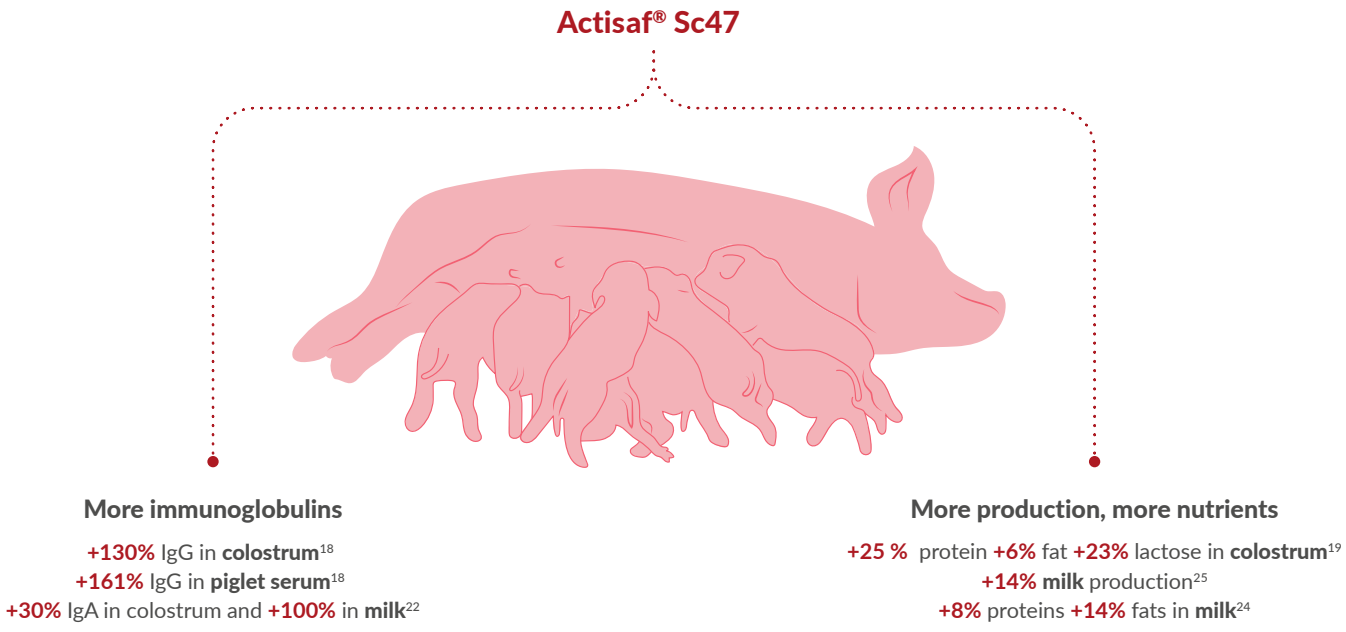


Figure 8. Benefits of Actisaf® Sc47 supplementation in sows' diet during the last month of gestation and lactation on improving the quality of colostrum and milk.

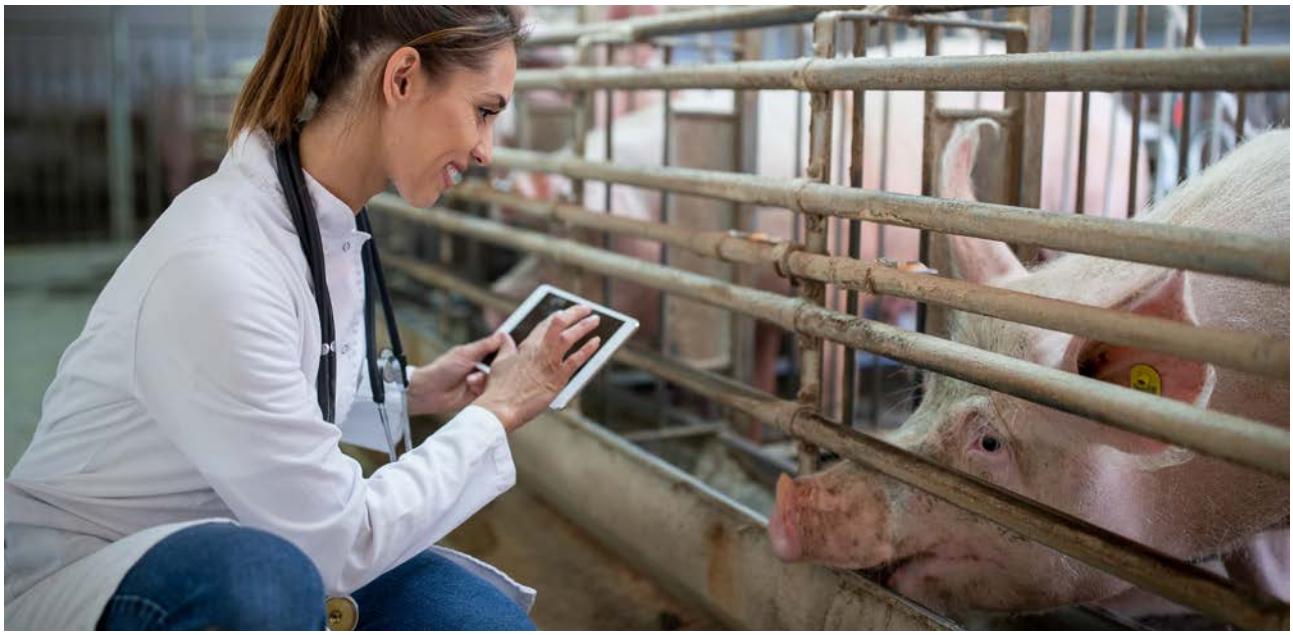
4. Yeast probiotic Actisaf® Sc47 to deliver higher quality piglets while preserving sow potential for optimal farm productivity

Improving body condition for better breeding performance

As a result of genetic selection for higher feed efficiency in growing and finishing pigs, sows from modern genetic lines have a lower voluntary consumption of feed, which may be insufficient to meet the nutritional demands for maintenance, body growth, and milk production. Since nutrient intake is prioritized for colostrum and milk production, nursing large litters requires a significant mobilization of body reserves. Sows are consequently in an intense catabolic state during lactation. This catabolic state is even more pronounced in young sows, particularly primiparous ones, whose feed intake and body reserves are lower than those of older sows or breeding herds under heat stress conditions.

Numerous studies have shown that excessive weight loss in sows negatively influences the weaning-to-estrus interval, subsequent farrowing rates, total litter sizes, and the variation in birth weight[26–28] due to insufficient restoration of follicle development, affecting ovulation rate and embryo quality[29,30]. Costermans and colleagues[31] also confirmed that higher backfat loss during lactation in unrestricted, fully-fed primiparous sows was negatively associated with follicular development in the ovary, confirming the importance of monitoring backfat thickness loss as an indicator of body reserve mobilization.

By improving the nutritional status of the lactating sow, Actisaf® Sc47 supplementation can play a significant role in enhancing the performance of the next breeding process and thus the lifetime performance of sows.



Securing the wean-to-estrus interval

A better nutritional status can help sows return to estrus more effectively. The wean-to-estrus interval has direct economic implications due to non-productive days, which can be estimated at 2-3€/day/sow. With the supplementation of Actisaf® Sc47 in sows' diets, Jang and colleagues[18] experienced a reduction of the wean-to-estrus interval by 2.2 days under experimental conditions.

Importantly, only 40% of non-supplemented sows were detected in estrus within 7 days in a previous study, whereas 100% of supplemented sows came into estrus within this desired breeding window[18]. Under commercial conditions, another recent trial showed that Actisaf® Sc47 supplementation helped increase the percentage of sows detected in estrus within 7 days by 10%, rising from 88% to 97%[32].

Enhancing prolificacy and weaning performance

Tzika and colleagues[25] followed the performance of multiparous sows following the same feeding program over 2 successive reproductive cycles. This study showed the positive effect of Actisaf® Sc47 supplementation during the last weeks of gestation and during lactation on sow body condition after the first cycle: bodyweight loss was reduced by 10.4% (58.82 kg vs 52.68 kg) and backfat loss by 1.3 mm (7.09 mm vs 5.79 mm) while the sows were able to milk a slightly larger litter (+0.2 weaned piglets), yielding a heavier litter at weaning by +3.1 kg (Figure 9). During the next reproductive cycle, the supplemented sows that received another time the same supplemented feed program showed better reproductive results, particularly improved prolificacy. Indeed, from a higher prolificacy of 0.4 piglets, the superiority of Actisaf® Sc47-supplemented sows increased to 0.9 additional piglets (Actisaf vs controls, number of piglets at cross-fostering in cycle 1: 12.9 vs 13.3 piglets; in cycle 2: 13.2 vs 14.1, $p<0.05$ at cross-fostering). At the second weaning, the supplemented sows weaned one additional piglet (11.7 vs 12.7 weaned piglets, $p<0.05$), and the litter weight was improved by 10.2 kg. In line with the first reproductive cycle observations, the supplemented sows lost significantly less body weight and less backfat, suggesting again a reduced catabolic burden during lactation despite the improvement in litter weight by 12% (83.1 kg vs 93.3 kg, $p<0.05$) (Figure 9).

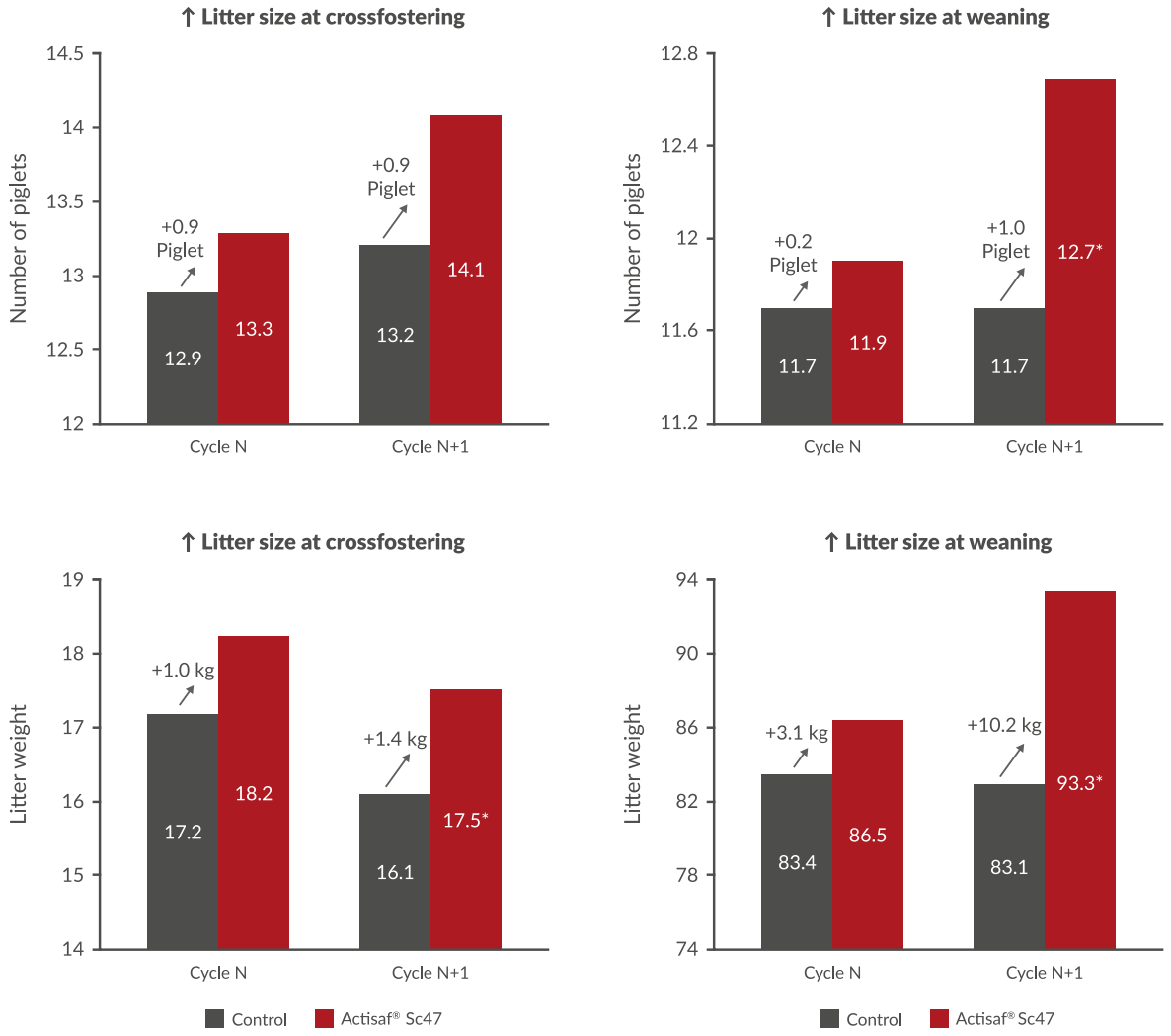


Figure 9. Effect of Actisaf® Sc47 on sow performance over two consecutive reproductive cycles. Supplementation was performed for 2 weeks pre-farrowing and during the whole lactation period for both reproductive cycles(*$p<0.05$)[25].

As a whole, Actisaf® Sc47 supplementation during a reproductive cycle can play a significant role in enhancing the performance of the next breeding process and thus to the longevity and lifetime performance of sows (Figure 10).

Actisaf® Sc47 helps sow increase lifetime performance and longevity

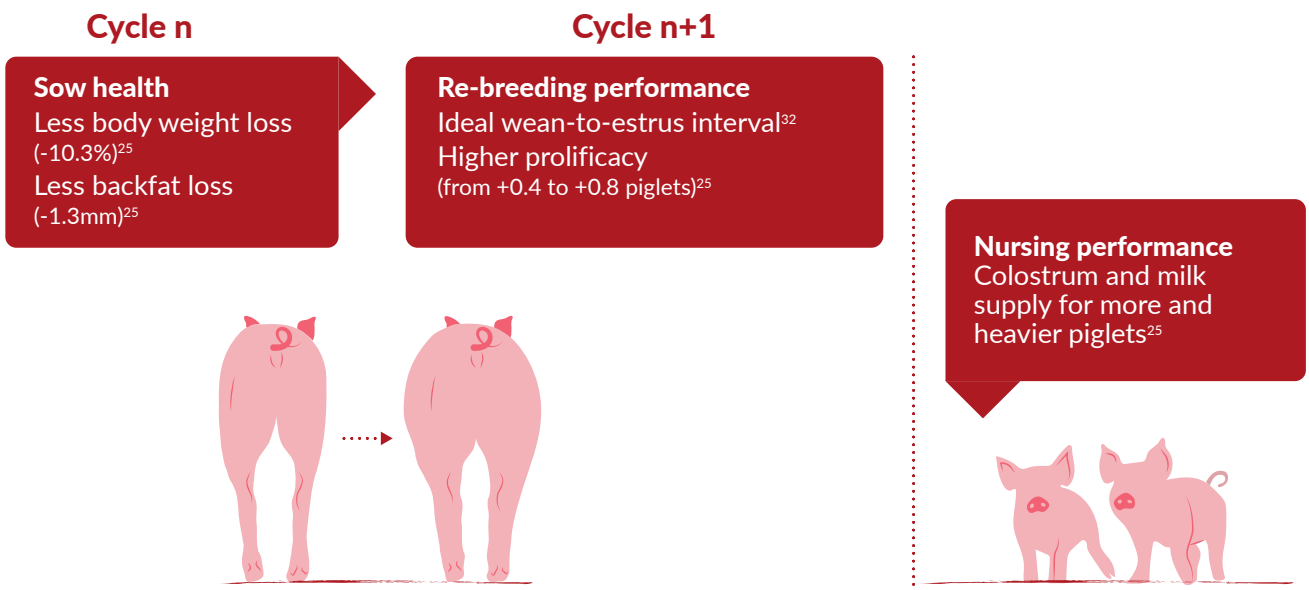


Figure 10. Benefits of Actisaf® Sc47 in sow diet during the end of gestation and the whole lactation on sow health, performance and longevity parameters.

Improving piglet performance

A healthy microbiota, coupled with high-quality and adequate quantities of colostrum and milk, is crucial for successfully weaning a large number of healthy piglets. These factors not only influence farm economic performance and animal health at weaning but also have long-term benefits. It is well known that bigger and healthier piglets at weaning reach slaughter age earlier. Piglets that suckled more colostrum can reach slaughter age or reach slaughter bodyweight earlier than those which suckled small quantities[33]. A healthy and stable microbiota is also associated with better gut resilience at weaning and better growth during the nursery period.

Supplementing yeast probiotic Actisaf® Sc47 during the last month of gestation and during lactation has demonstrated a positive impact on sow reproductive performance, particularly performance at birth and weaning. Recently, a meta-analysis was conducted to evaluate the efficacy of the yeast probiotic Actisaf® Sc47 in improving the reproductive parameters of modern sows under commercial field conditions (Figure 11). This analysis combined results from seven studies, including data from hyperprolific breeds and over 3,000 weaned litters (Table 1).

Table 1. Reproductive performance of sows supplemented with yeast probiotic Actisaf® Sc47 during late gestation and lactation over 7 field trials. Two trials included 2 consecutive reproductive cycles[34].

Parameter	Number of cycles included	Mean Difference (with 95% CI)	*P-value*
Average total born	7	+0,20 (-0,31 to +0,72)	0.45
Average born alive	8	+0,56 (+0,14 to +0,99)	0.009
Number of weaned	9	+0,30 (+0,27 to +0,33)	<0.001
Average litter weight (kg)	7	+4,12 (+1,89 to +6,35)	<0.001
Average piglet weight (kg)	6	+0,23 (+0,09 to +0,36)	<0.001
Number of days of lactation	4	-0,84 (-1,19 to -0,50)	<0.001

The results were compelling and prove the consistency of the performance of Actisaf® Sc47 supplementation: feeding sows with the yeast probiotic Actisaf® Sc47 during the last month of gestation and during lactation significantly improved reproductive outcomes. The number of live-born piglets per litter from supplemented sows increased by 0.56 piglets, and the number of weaned piglets increased by 0.30 piglets per litter[34].

Additionally, piglets weaned by supplemented sows gained an extra 230 g each. Overall, litters from supplemented sows were 4.12 kg heavier at weaning, and this performance boost was observed in both early and late-weaned sows.

Increasing the average weaning weight usually means that fewer small piglets are present. This observation was reported following a yeast probiotic supplementation strategy where a reduction from 22% to 9% in the proportion of low-weight piglets at weaning was observed[35].

This is particularly important as low-weight piglets are more susceptible to health issues and have lower survival rates[36]. The reduction in low-weight piglets suggests that Actisaf® Sc47 helps in achieving more uniform growth and development among piglets.

Actisaf® Sc47 helps wean better-quality piglets

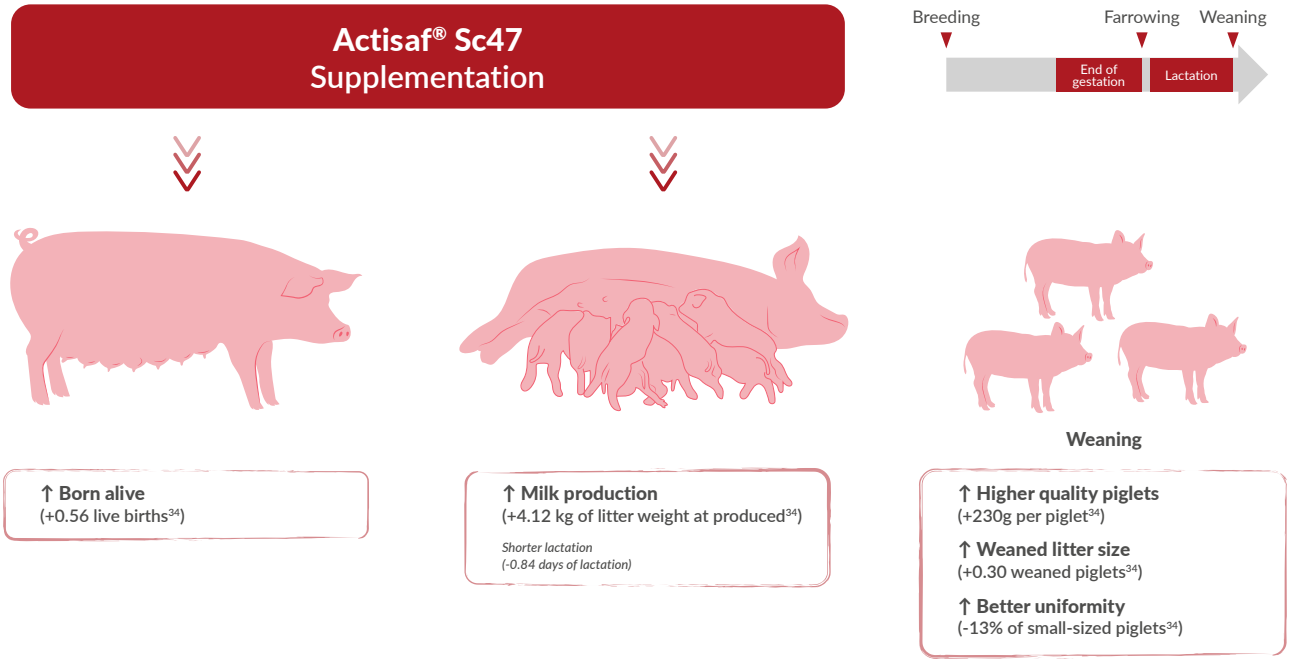


Figure 11. Key benefits and results of Actisaf® Sc47 supplementation on sows' reproductive performance [34].

These findings underscore the more relevant than ever importance of incorporating the yeast probiotic Actisaf® Sc47 into modern swine nutritional strategies.

By improving microbiota, colostrum, and milk quality and supporting better nutritional and health status in sows and piglets, the yeast probiotic Actisaf® Sc47 plays a crucial role in enhancing sow and piglet performance.

5. Conclusion

The program Neonate designed by Phileo by Lesaffre, through the supplementation of sows with the yeast probiotic Actisaf® Sc47 during the end of gestation and during lactation, presents numerous benefits by significantly enhancing the health and productivity of both sows and piglets (Figure 12). Extensive research has demonstrated that Actisaf® Sc47 effectively improves gut health, colostrum and milk quality, and overall reproductive performance of the sow, contributing to better health and performance of piglets.

Actisaf® Sc47 supports the establishment of a balanced gut microbiota in sows, which ultimately influences the establishment of a healthier piglet gut microbiota. In sows, this specifically leads to improved nutrient absorption, reduced constipation, and better overall health. In piglets, the healthier microbiota leads to an improved gut homeostasis. Additionally, supplementation with Actisaf® Sc47 significantly increases the immunoglobulin content in colostrum and milk, boosting IgG and IgA levels, respectively. This enhancement ensures robust passive immunity transfer to piglets, reducing their vulnerability to infections and improving their chances of survival. Actisaf® Sc47 also improves the nutritional profile of colostrum and milk, increasing the levels of vital nutrients such as proteins, fats, and lactose, which are essential for the energy, growth, and thermoregulation of piglets. All these benefits allow piglets to survive and reach higher bodyweights at weaning. In addition, by reducing the negative impact of nursing on sow body condition, Actisaf® Sc47 also helps them return to estrus more effectively, contributing to the maintenance of the breeding schedule and to the reduction of the culling rate. Improved body condition at weaning also can contribute to increased litter size at the next breeding cycle.

Benefits of microbiota modulation with Actisaf® Sc47 in the gestating & lactating sow

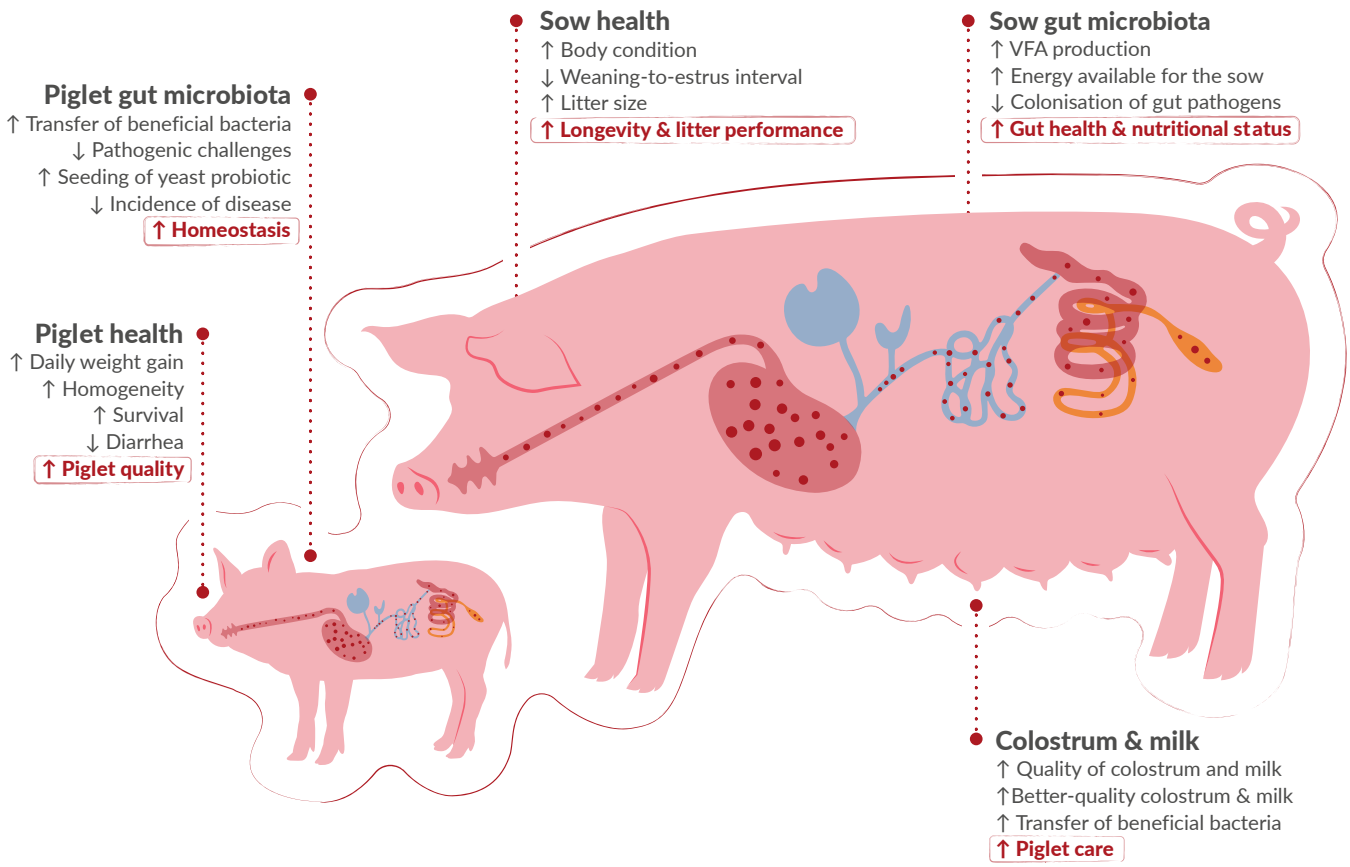


Figure 12. Enhancing sow and piglet health and performance through gut microbiota modulation by Actisaf® Sc 47 supplementation in sows' diet.

The use of Actisaf® Sc47 in sow diets translates into the weaning of healthier sows and piglets, resulting in improved overall herd performance, higher productivity, and increased breeder longevity. The improved health and growth of piglets ensure a more uniform and robust group of piglets ready for the nursery, grower, and finisher stages, enhancing the efficiency of the entire production cycle. Additionally, the reduction in losses due to improved piglet health directly contributes to cost savings for farmers.

With healthier and more productive sows and piglets, the swine industry can achieve higher productivity. The improved nutrient absorption and reduced feed waste due to better gut health contribute to more sustainable farming practices. Efficient nutrient utilization means that less feed is required to achieve optimal growth, reducing the environmental footprint of swine production (Figure 13).

Program Neonate

Improved health, growth and productivity of sows and piglets

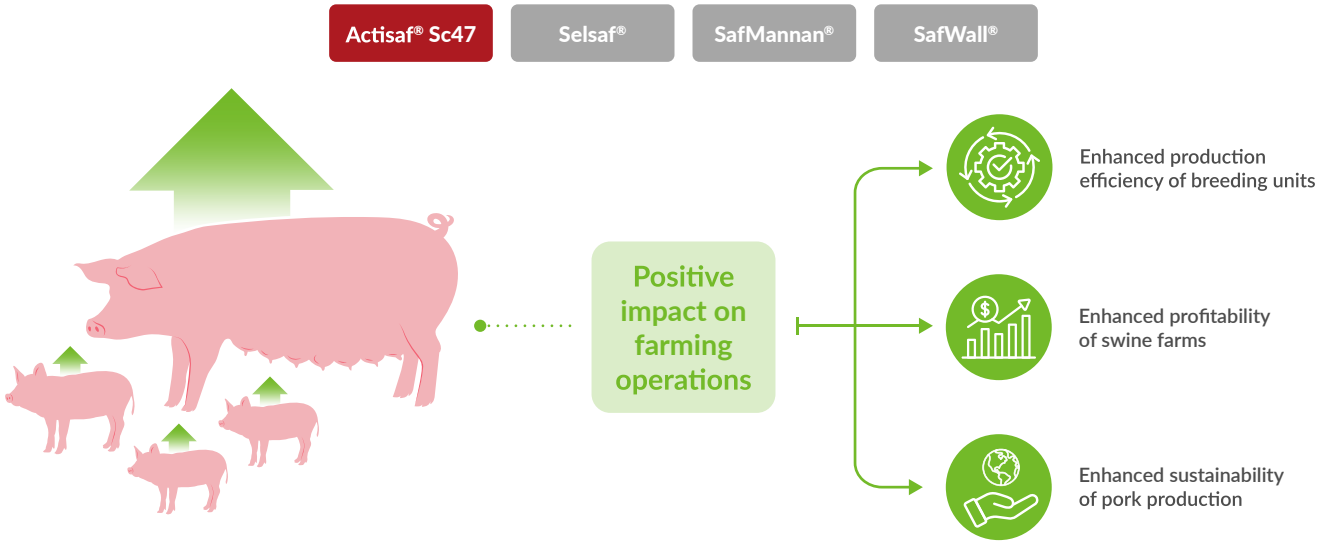


Figure 13. Key benefits and results of Actisaf® Sc47 supplementation on the breeding herd performance.

In conclusion, the supplementation of sow diets with yeast probiotics, particularly Actisaf® Sc47, offers substantial benefits to the health, productivity, and sustainability of swine farming operations (Figure 13). These improvements not only support the performance and welfare of sows and piglets but also provide significant economic and environmental advantages for farmers, establishing Actisaf® Sc47 as a vital addition to modern swine nutrition strategies.

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