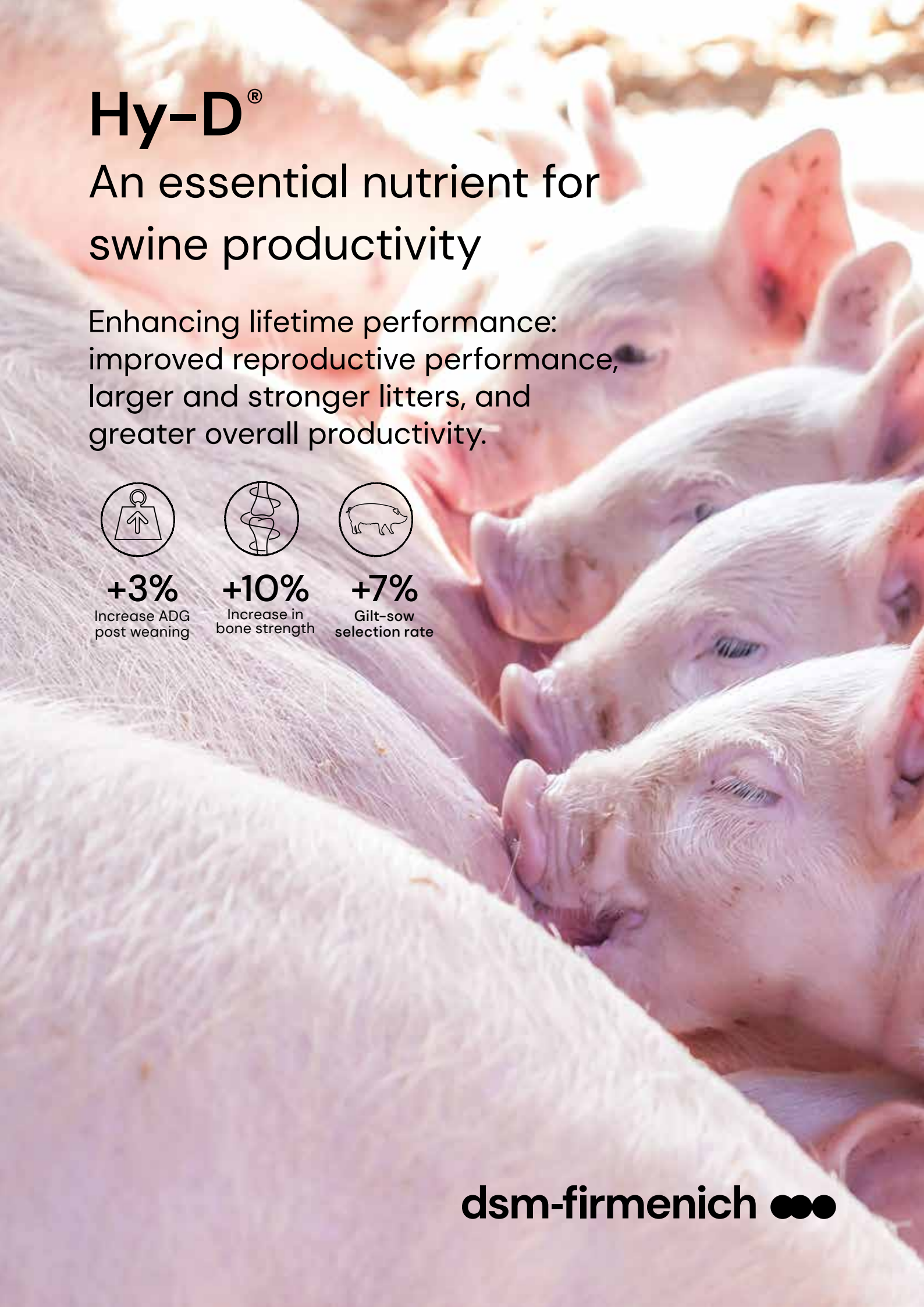
Hy-D®

An essential nutrient for swine productivity

Enhancing lifetime performance: improved reproductive performance, larger and stronger litters, and greater overall productivity.



+3%
Increase ADG post weaning

+10%
Increase in bone strength

+7%
Gilt-sow selection rate

dsm-firmenich

Hy-D®
Feeding highly productive pigs

Cost-effective production throughout the life cycle:

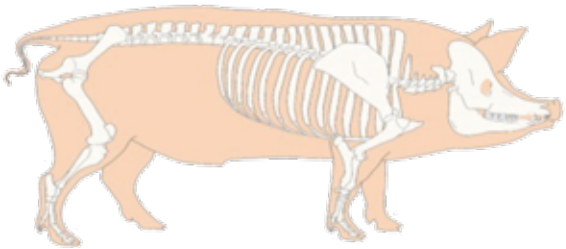
The profitability of pig production relies on maximizing the sow's reproductive lifetime performance relative to the space she occupies. Noteworthy enhancements have been accomplished in pig performance, encompassing improvements in litter size and feed efficiency.

Main benefits of adding Hy-D® to sow and gilt diets:

- Improved skeletal health and mobility of animals
- Increased gilt selection rate
- Improved reproductive performance: increased litter size and weight

The importance of strong and healthy sows and gilts

To unlock the full genetic potential of a breeding sow, it is essential for the animal to possess a sufficiently robust skeletal structure. Lameness stands out as a primary cause for the premature culling of sows. A healthy locomotor system plays a pivotal role in the selection of breeding stock.

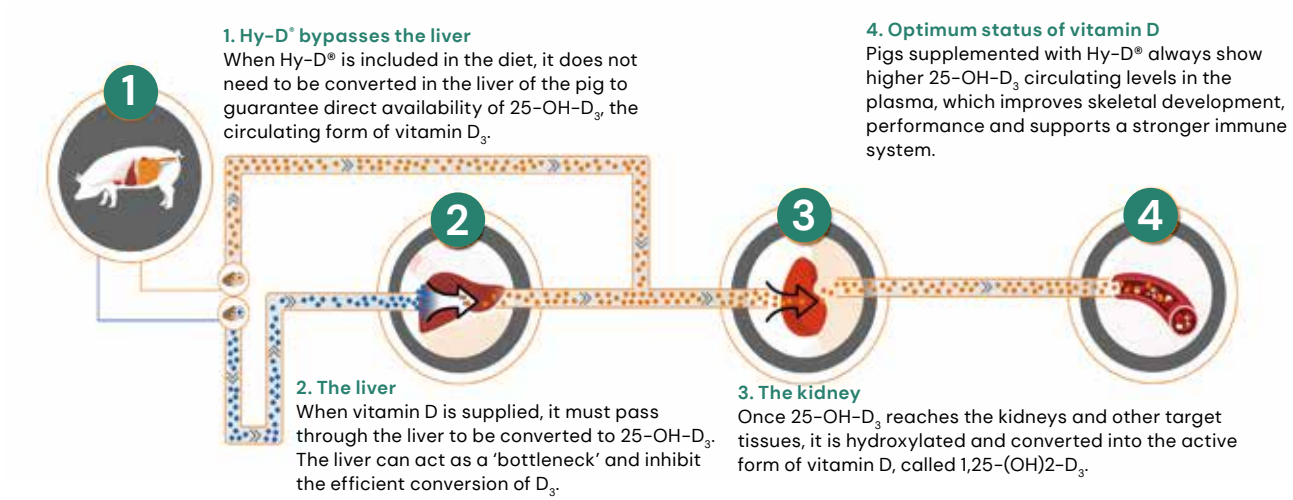


Hy-D®: A unique mode of action

Hy-D® allows the first metabolic step to be by-passed and due to its structure Hy-D® is absorbed in the intestine more effectively than vitamin D_3. The result is superior and faster uptake and higher circulating 25-OH-D_3 levels.

The second metabolic step is controlled by the calcium and phosphorus demand, immune system activation and demand for protein synthesis, but is dependent on the availability of sufficient circulating 25-OH-D_3.

Together, these allow the pigs to achieve their genetic potential for growth and productivity.



1. Hy-D® bypasses the liver
When Hy-D® is included in the diet, it does not need to be converted in the liver of the pig to guarantee direct availability of 25-OH-D_3, the circulating form of vitamin D_3.

2. The liver
When vitamin D is supplied, it must pass through the liver to be converted to 25-OH-D_3. The liver can act as a 'bottleneck' and inhibit the efficient conversion of D_3.

3. The kidney
Once 25-OH-D_3 reaches the kidneys and other target tissues, it is hydroxylated and converted into the active form of vitamin D, called 1,25-(OH)2-D_3.

4. Optimum status of vitamin D
Pigs supplemented with Hy-D® always show higher 25-OH-D_3 circulating levels in the plasma, which improves skeletal development, performance and supports a stronger immune system.

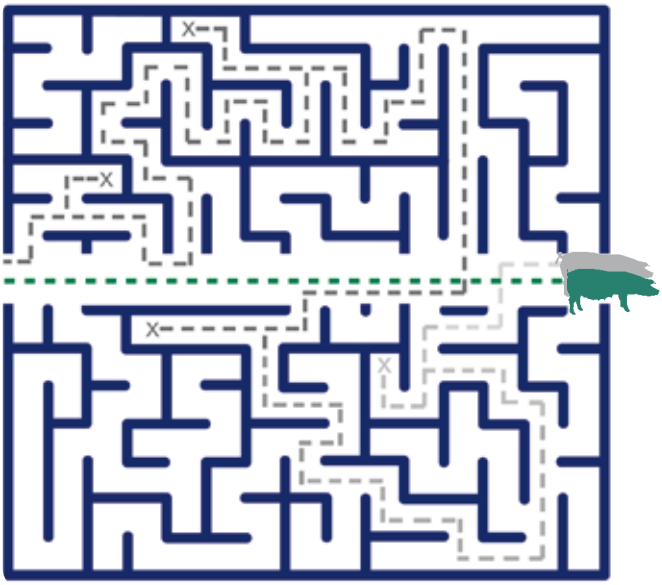
Figure 1: Hy-D®: a unique mode of action

The shorter the pathway ...

... the greater the benefits

Hy-D® is a unique feed supplement which already contains 25-OH-D_3, which can be directly absorbed by the pig and enter the bloodstream. Plasma levels of 25-OH-D_3 are much higher because Hy-D® does not need to undergo the critical metabolic stage in the liver.

The benefits of using Hy-D® cannot be achieved by simply increasing the inclusion of vitamin D_3 in feed. The inclusion of Hy-D® in the diet ensures that sufficient levels of 25-OH-D_3 pass directly into the blood.



Vitamin D_3 ----------

Hy-D® ----------

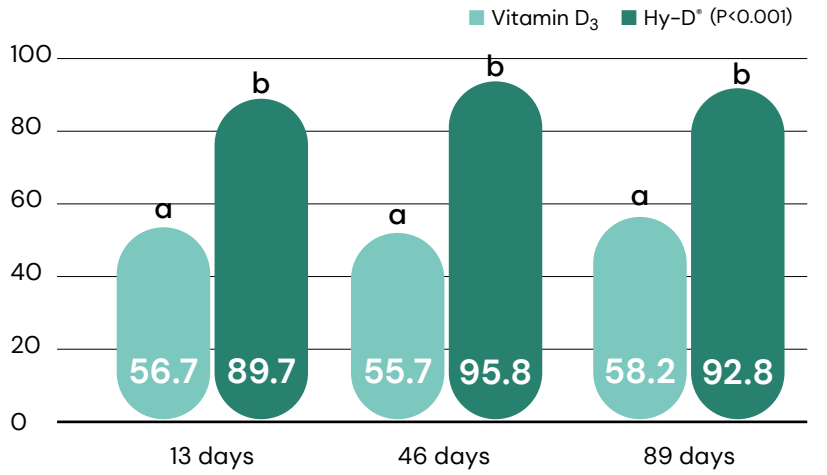


Hy-D® – Health benefits

Feeding Hy-D® to pigs guarantees higher circulating levels of 25-OH-D_3 in blood

More 25-OH-D_3 and greater availability

Study results indicate that piglets from sows fed Hy-D® have higher blood levels of 25-OH-D_3 than piglets from sows fed equivalent levels of vitamin D_3.



Reference: Coffey *et al.*, 2012

Figure 2: 25-OH-D_3 plasma levels (units) in piglets

Stronger skeleton

Increased bone strength

Body conformation

↓

Skeletal structure

Gilts	Sows
Structural function Bone development	**Physiological function** Mineral storage and release (Ca/P)
Metrics: • Bone strength	**Metrics:** • Bone mineralization

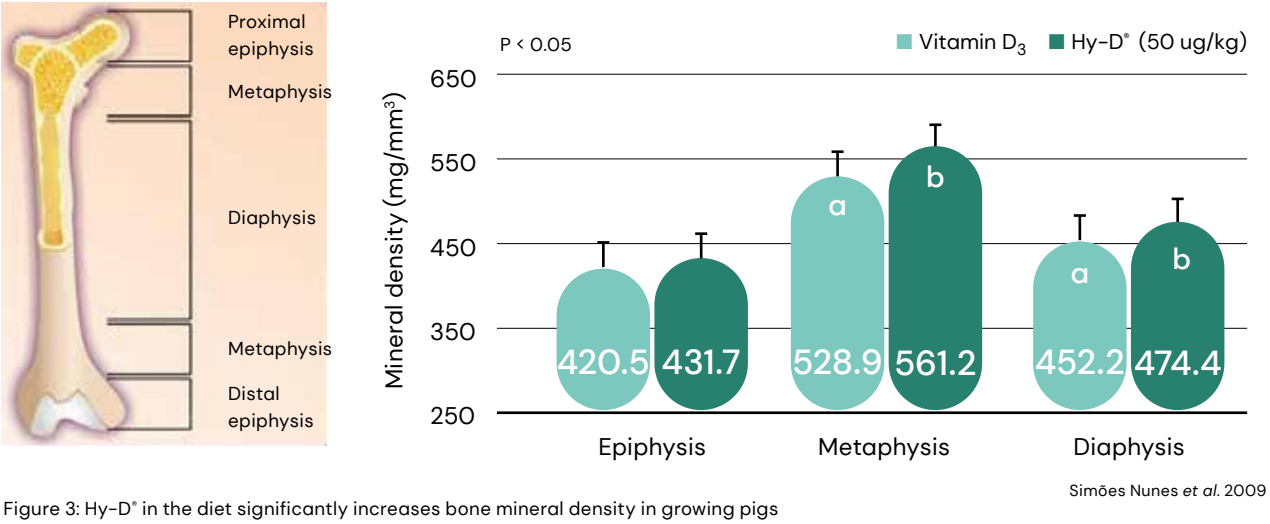
Improves sow lifetime performance

1. Improved skeletal health

Sows benefit from high efficiency during their reproductive life and increased longevity

- Improving skeletal strength can reduce the number of animals not selected due to leg and bone weakness, thereby increasing productivity during breeding life
- Stronger gilts and sows also yield advantages in terms of increased litter size, as well as higher piglet birth and weaning weights
- This increased productivity per farrowing, coupled with an increased number of parities, results in enhanced lifetime productivity and improved financial returns

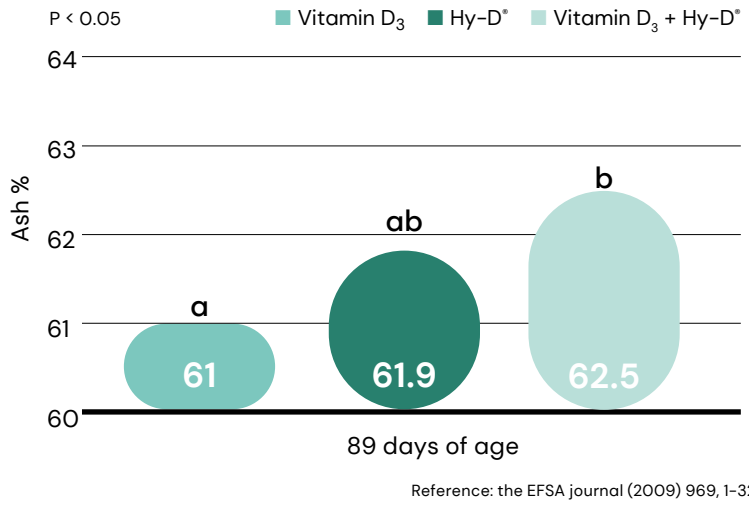
Effect on bone density



Simões Nunes *et al.* 2009

Figure 3: Hy-D® in the diet significantly increases bone mineral density in growing pigs

Bone mineralization



Reference: the EFSA journal (2009) 969, 1-32



Figure 4: Bone mineralization in growing pigs

2. Increased gilt reproductive performance

More gilts suitable for breeding

Findings from research conducted in various countries indicate that supplementing the diet of growing gilts with Hy-D® results in a greater percentage of gilts being selected as replacements for the breeding stock. This is because gilts will have a better bone structure and an improved skeletal conformation. Increasing the number of available replacement gilts consistently enhances the genetic potential of the stock.

Gilt selection rate

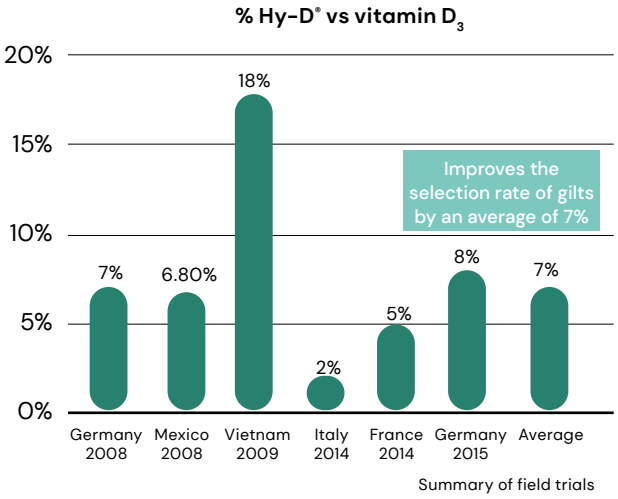


Figure 5: Hy-D® results in consistently increasing gilt selection rates

Gilt litter weight

Figure 6: Hy-D® increases the litter weight of gilts

	Control	Hy-D®	P=
Litter size	10.2	12.7	0.04
Litter weight, kg	6.5	8.2	<0.01
Fetal weight, g	626.2	636.6	0.80

Maternal supplementation with Hy-D® improved:

Litter size and weight, without no deleterious effect on fetal weight.

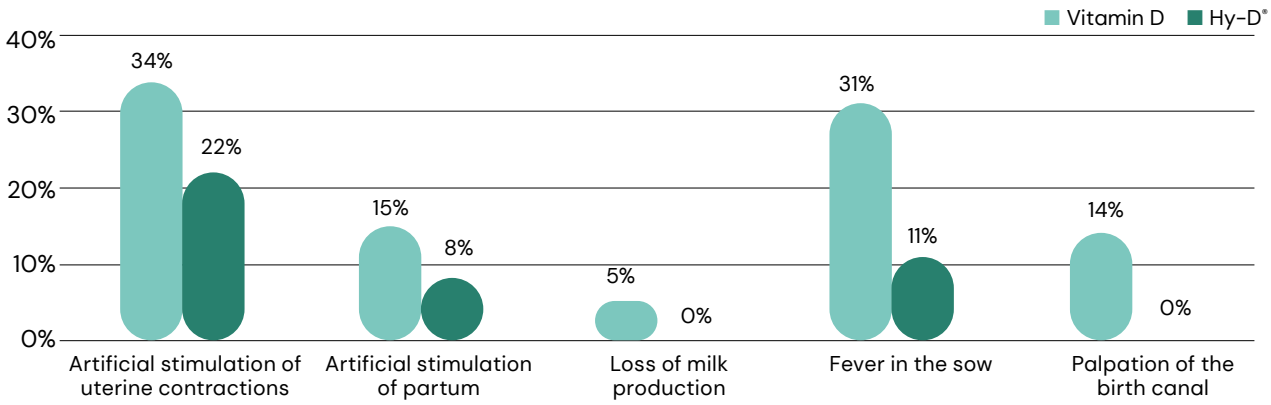
Trial with primiparous gilts, Hy-D® suplemmentation from 43 d before service and during 90 days of gestation.

Control 2,500 IU/kg vitamin D3 vs. Hy-D® 50 µg/kg + 500 IU/kg vitamin D_3.

3. Increased sow productivity

Impact on farrowing and lactation efficiency

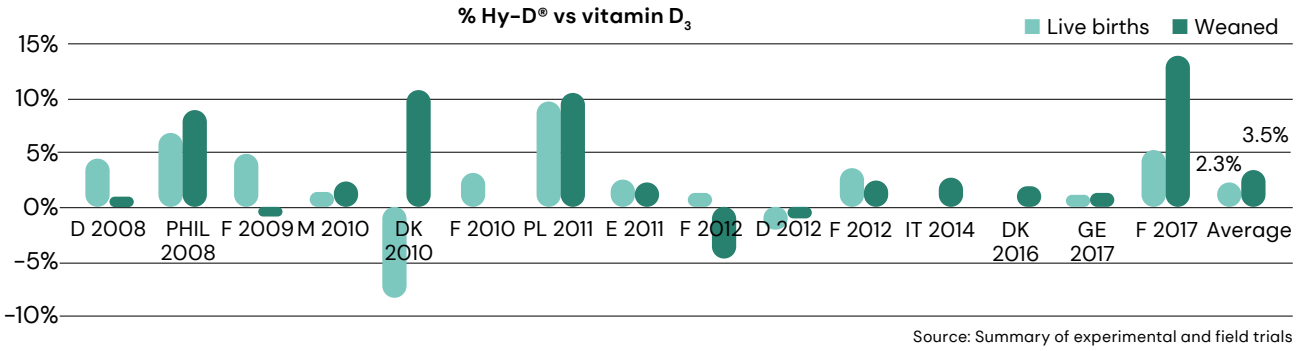
Supplementing sows with Hy-D® resulted in fewer complications and reduced interventions during parturition, attributed to the enhanced availability of calcium during the critical phase of farrowing.



Trial in France, 2012; Meuter *et al.*, JRP 2016

Improves sow productivity

Hy-D® increased by +2. 3% the number of piglets born alive and by +3.5% the number of weaned piglets.



Source: Summary of experimental and field trials

Hy-D® – Growth performance

Hy-D® supplementation significantly increased body weight and average daily gain throughout the entire production cycle of fattening pigs (*Figure 7*).

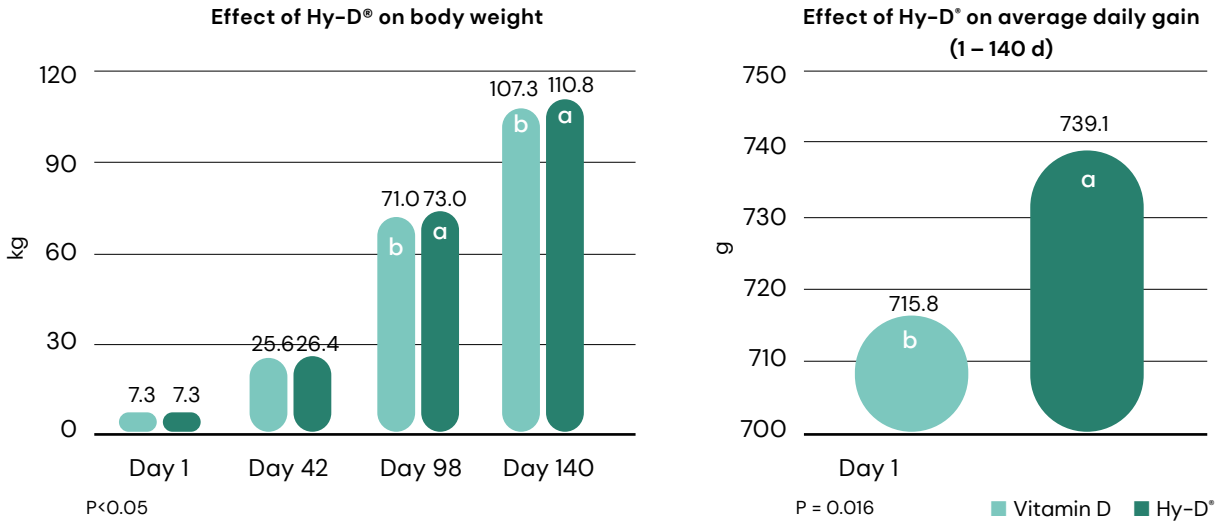


Figure 7: Hy-D® – Impact on body weight and weight gain in fattening pigs

Upadhaya *et al.*, 2022



For pigs to develop a strong skeleton throughout their productive life, we recommend adding Hy-D® 1.25% to diets at a dose of 4g/ton of feed, resulting in a level of 50 µg of 25-OH-D_3 per kg of feed.

If Hy-D® and vitamin D_3 are used in the same diet, check to ensure that local regulations on total vitamin D_3 levels are observed.



Improved formulation uses spray-dried beadlet technology to finish the Hy-D® product. This gives a more uniform, better-flowing product with good mixing properties.



Hy-D® is stable when included in pelleted feeds under standard conditions (pelleting temperature up to 90 °C).

We bring progress to life

Scan to know more or visit
dsm-firmenich.com/anh

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