

# Presentation Outline

- I. The Philippine Swine Repopulation Objective
- II. Building the Right Foundation in Increasing Sow Productivity
- III. Achieving Higher Number of Live, Heavy and Healthy Pigs up to the Nursery Phase, Setting them up for Success to Market
- IV. Managing piglets produced by highly productive sows
- V. Conclusion and Recommendation



# The Philippine Swine Repopulation Objective

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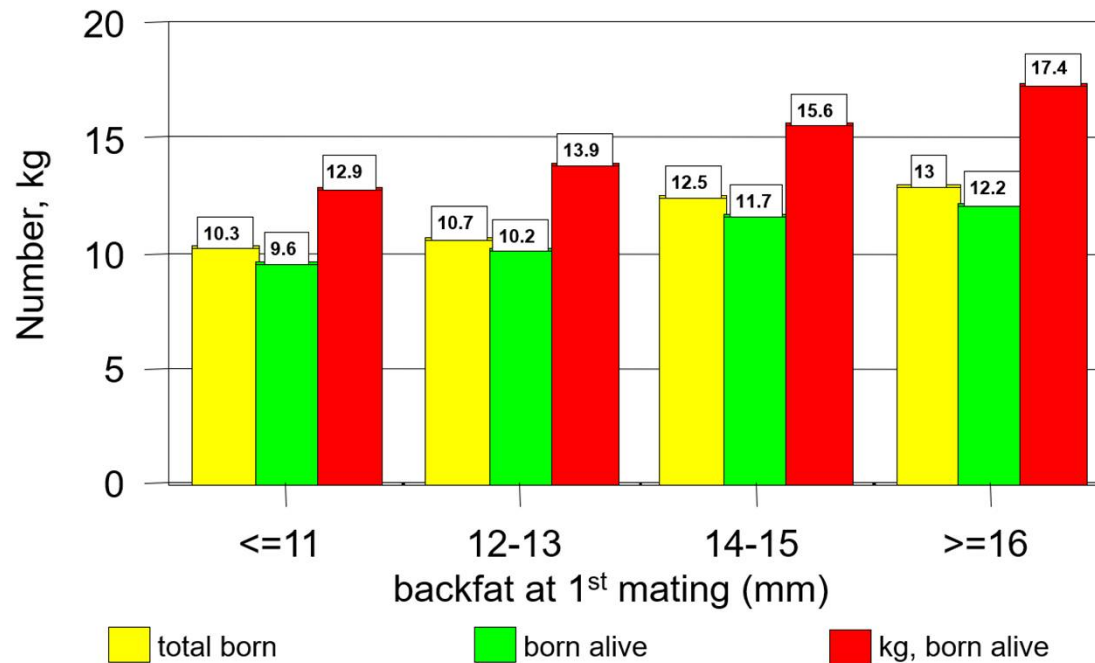
Speed and Increase in productivity is a vital facet in speeding up the Philippine Swine Industry recovery from African Swine Fever (ASF).

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# Build the Right Foundation for Gilts

*Weight and backfat at 2<sup>nd</sup> heat or breeding are critical for maturity, litter size and longevity.*

Figure 1. Effect of backfat on 1<sup>st</sup> litter



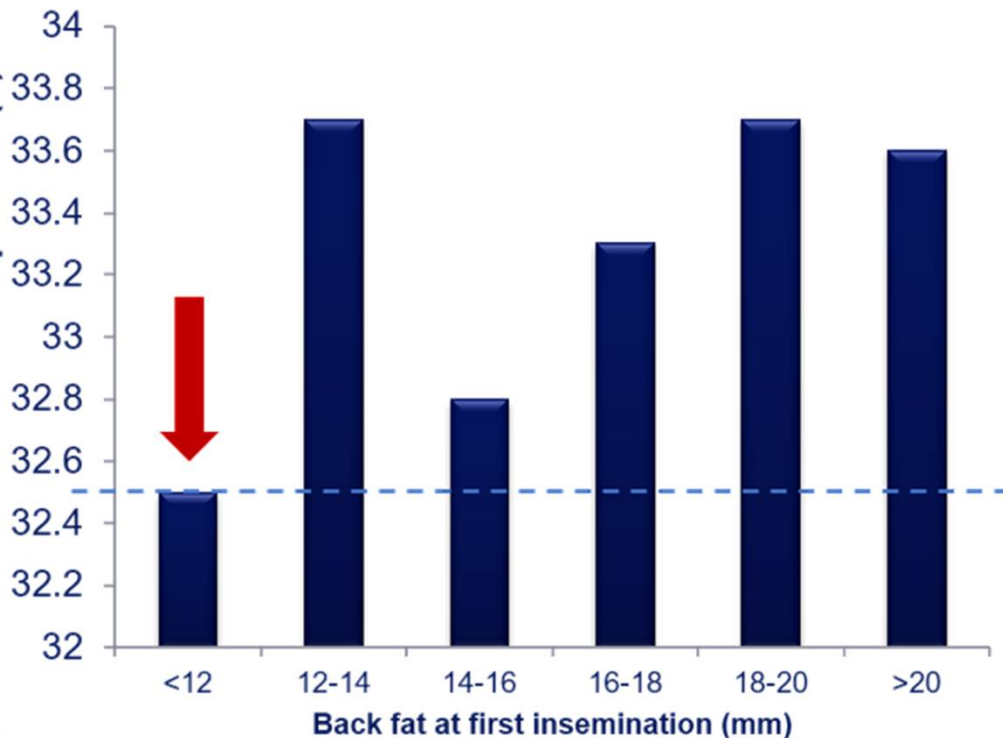
Source: Provimi Research



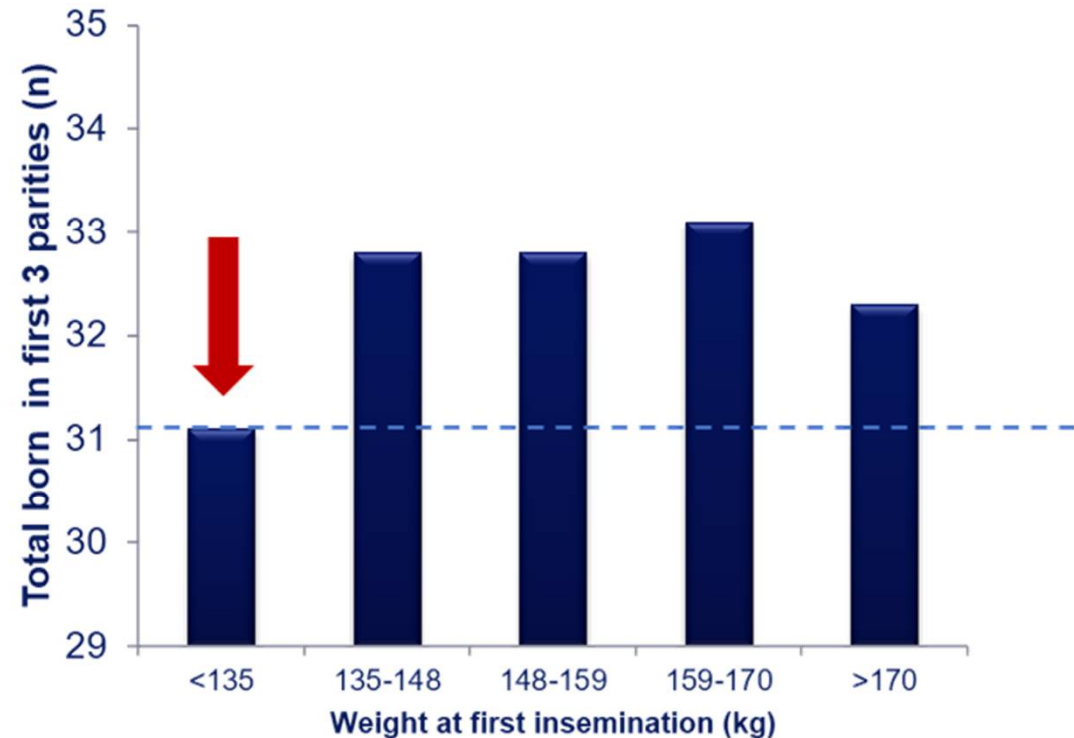
# Build the Right Foundation for Gilts

*Weight and backfat at 1<sup>st</sup> insemination are critical for maturity, higher litter size and longevity.*

**Figure 2. Effect of backfat at first insemination**



**Figure 3. Effect of weight at first insemination**



Source: Cargill Animal Nutrition Research

# Build the Right Foundation for Gilts

*Specialized Gilt dietary requirement is critical for development and achievement of desired backfat body weight.*

**Growth capacity of modern sows increase the need for good diets even more.**

locomotive problems with high growth rate  
 ensure gilts during development

**Grower diet**  
 protein and mineral content not for long term growth and production  
 relatively high lysine and energy

**Finisher diet**  
 designed for (almost) fully grown animals  
 low lysine

Table 1. Gilt Dietary Requirement versus practice

Nutrient (per kg)	Grower	Finisher	Gestation
Gilt vs. other	Gilt (<45 kg)	Gilt developer (>45kg)	
Energy (MJ ME)	=	↓	↑
AID Lysine (%)	↓	↓	↑
Fiber (%)	=	↑	↓
Calcium (%)	↑	↑	=
Dig. P (%)	↑	↑	=
Magnesium (%)	↑	↑	↑
Vitamin E (IU)	↑	↑	=
Selenium (mg)	↑	↑	=
Biotin (mg)	↑	↑	=
Folic Acid (mg)	↑	↑	=
Zinc (mg)	↑	↑	=

Source: Cargill Research

Legend:

- ↓ need to reduce
- ↑ need to increase



# Build the Right Foundation for Gilts

*dietary requirement is critical for development and achievement of desired backfat and body weight*

Body weight, back fat, age and growth rate go hand in hand  
Modern sows are very lean

- Back fat less important
- Weight and age more important
  - Growth rate too fast: locomotive problems

Table 2. Gilt Critical Parameters & Recommendations

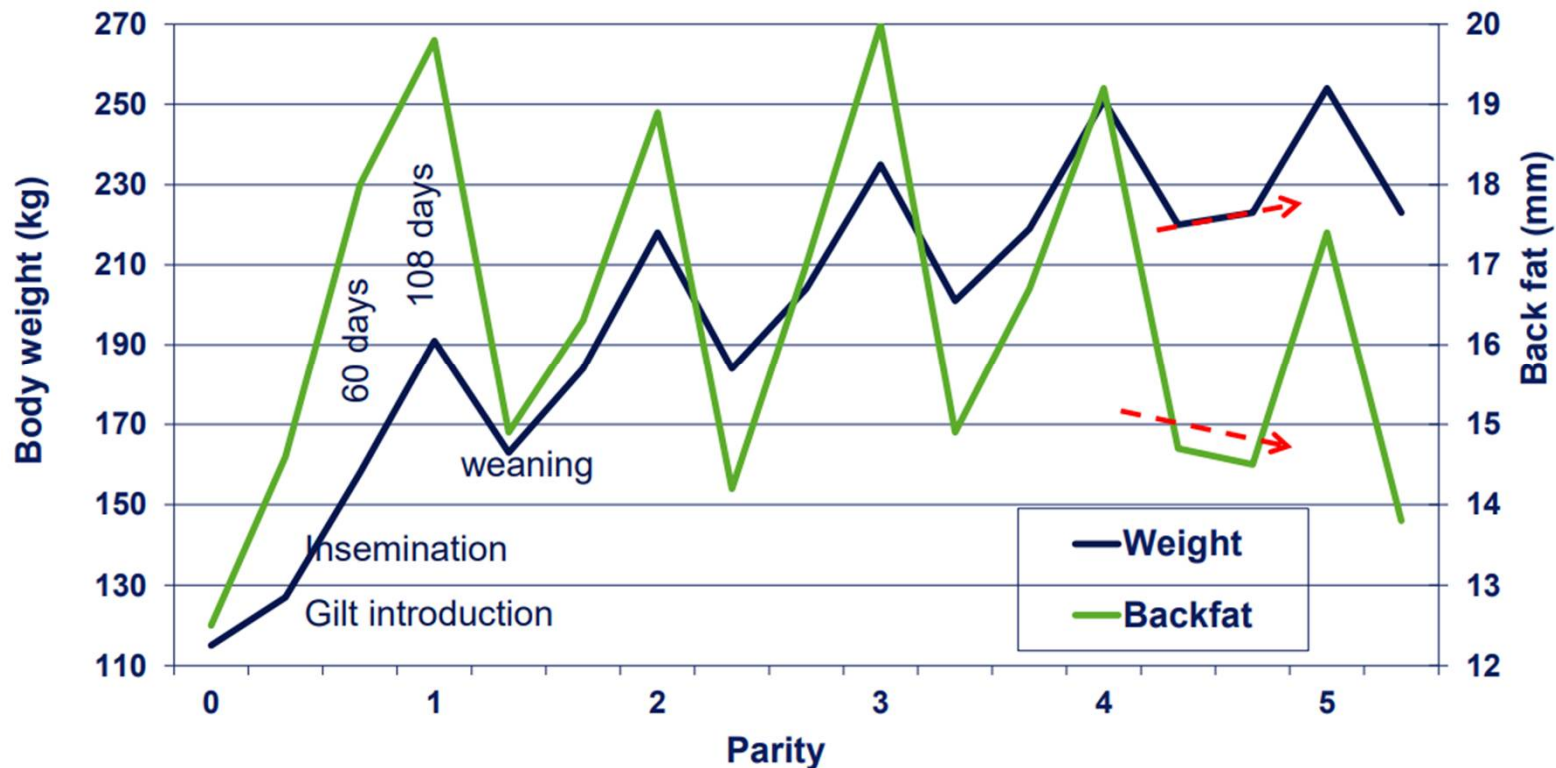
Critical Points	Recommendation
Weight (kg)	135 – 155
Nr. Estrus at first insemination (n)	2 <sup>nd</sup>
Daily Live weight gain (gr/day)	650 – 800
Age (days)	220 – 240
Back fat (mm, P2)	13 – 15



# Manage Sows to increase litter size born alive, total litter birth weight and total litter weaning weight.

Increasing fertility, reducing still birth and pre-weaning mortality are critical to increase sow productivity.

Figure 4. Impact of Backfat and Body Weight to Longevity (Parity)



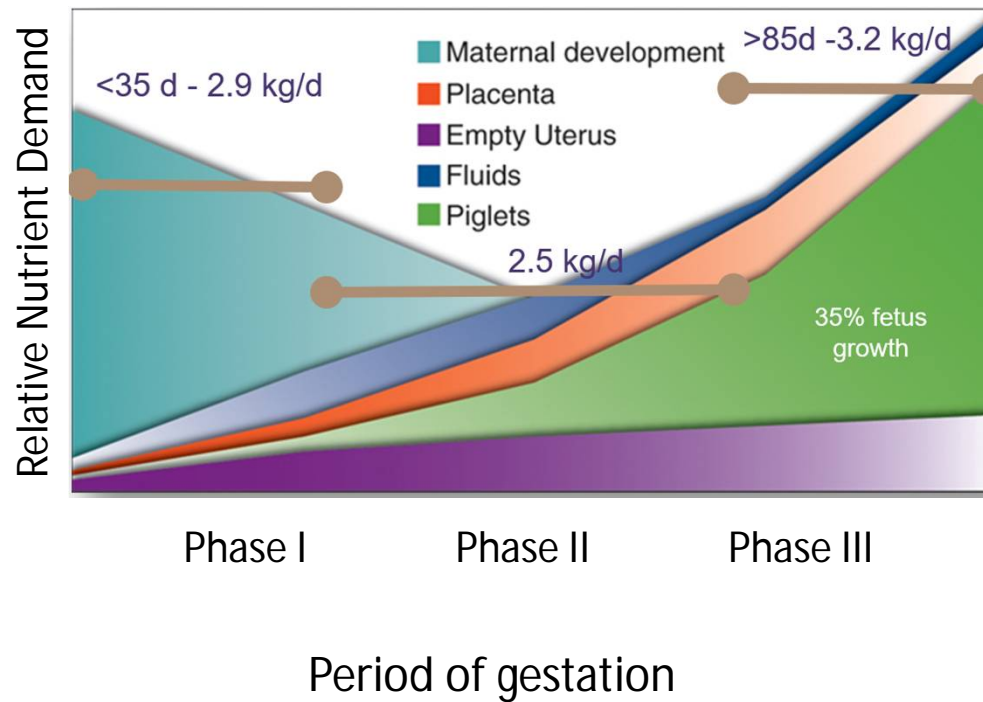
# Manage Sows to increase litter size born alive, total litter birth weight and total litter weaning weight.

Enhancing fertility, reducing still birth and pre-weaning mortality are critical to increase sow productivity.

## Pro-Hi Feeding Program.

Pro-Hi feeding sows by satisfying specific diet requirement based on backfat and stages of gestation.

Fig 6. Dietary Nutrient Demand of Sows During Gestation Period





# Manage Sows to increase litter size born alive, total litter birth weight and total litter weaning weight.

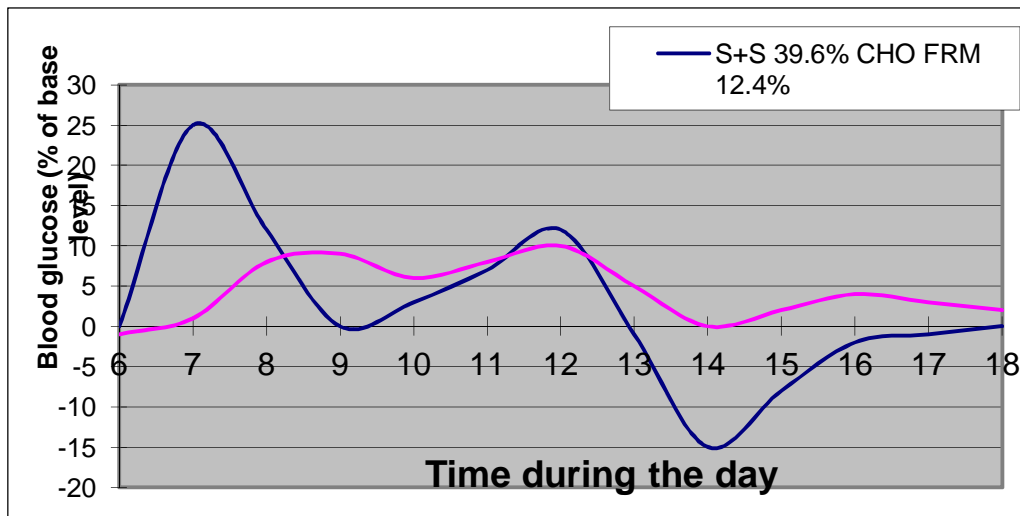
Enhancing fertility, reducing still birth and pre-weaning mortality are critical to increase sow productivity.

## Fermentable Carbohydrates

These carbohydrates appear in the blood and thus insulin levels are less "spiking" levels and maintained at higher level for a prolonged time after feeding the meal resulting to:

- Less anti-progesterone effect
- Better satiety = less stress in sows (especially in group housing)

Fig 5. Impact of Fermentable Carbohydrates in Gestating Sows Blood Glucose Level.



Source: De Leeuw et al., 2004



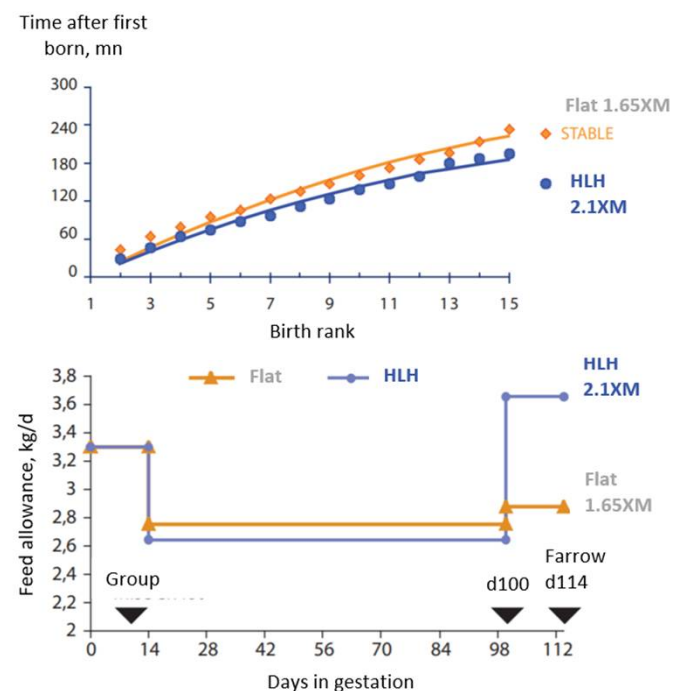
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## High-Feeding Program.

Table 3. Effect of HLH Feeding Program to Farrowing and Litter Vitality

Feeding schedule	Flat	HLH -0.15kg<d100 +0.8kg>d100	Stat.
Body weight after farrow, kg	237	242	P<0.05
Back fat at farrow, mm	18.6	18.0	NS
Total born /litter	13.8	13.9	NS
Piglet livability, %	80	80	-
Birth weight, kg	1.37	1.39	NS
% farrowing without assistance	71	84	P<0.05
% litter with high vitality <sup>1</sup>	29	48	P=0.07
ADFI lactation, kg/d	6.4	6.1	P<0.05
Weight loss in lactation, kg	21 (8.8%)	26 (10.7%)	P<0.05
Litter gain, kg/d	2.85	2.86	NS
WEI, days	5.3	5.3	NS



330 gestations. 15 replicates/treatment. LWxLD sows. Gilts and sows. Average parity : 2.83  
 1. Litters with more than 9 piglets out of 10 accessing the udder within one hour after birth

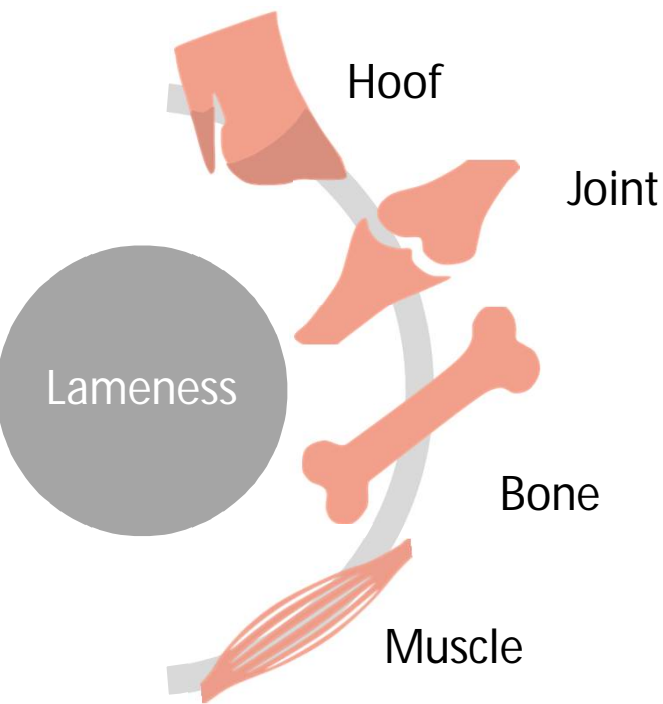
Quiniou, 2008



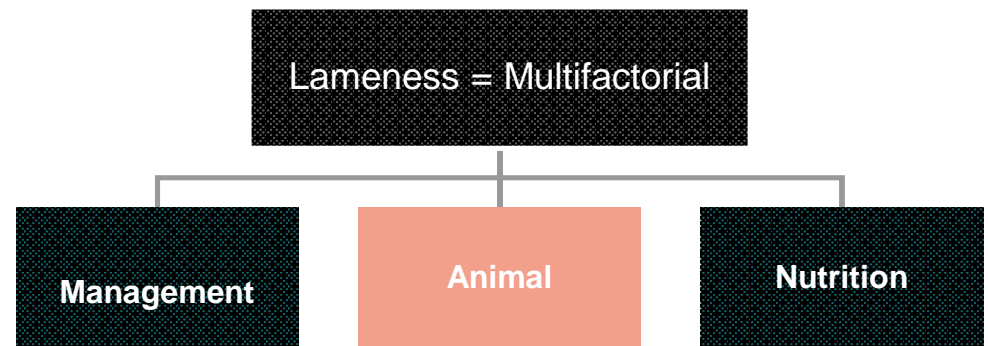
# Manage Sows to increase litter size born alive, total litter birth weight and total litter weaning weight.

Enhancing fertility, reducing still birth and pre-weaning mortality are critical to increase sow productivity.

Health.



- Lameness can originate from:
  - Muscle stiffness
  - Bone lesions
  - Joint related problems
  - Hoof quality/lesions
- Exact cause is hard to diagnose.



# Manage Sows to increase litter size born alive, total litter birth weight and total litter weaning weight.

Enhancing fertility, reducing still birth and pre-weaning mortality are critical to increase sow productivity

Health.

## Teagasc tested 3 diets and looked at effect on locomotive health

Weight Range	Gilt Developer*	Finisher Diet	Gestating Sow
65 - 100 kg	Developer (restricted**)	Finisher (ad lib)	Finisher (ad lib)
100 - 130 kg	Developer (restricted**)	Finisher (ad lib)	Gestating (restricted**)
130 - 140 kg***	Developer (ad lib)	Finisher (ad lib)	Gestating (ad lib)

\*Gilt developer diets were fortified by (organic) trace minerals such as zinc, copper and manganese

\*\*Restricted = 2,25kg/day

\*\*\*Gilts were slaughtered at 12 weeks of age

## Percentage of gilts affected by lameness per week

Weight Range	Gilt Developer*	Finisher Diet	Gestating Sow
Day 0	0	0	0
Week 1-4	0	2,2	2,1
Week 5-8	0	9,1	20,8
Week 9-12	0	17,7	14,6

Source: Teagasc



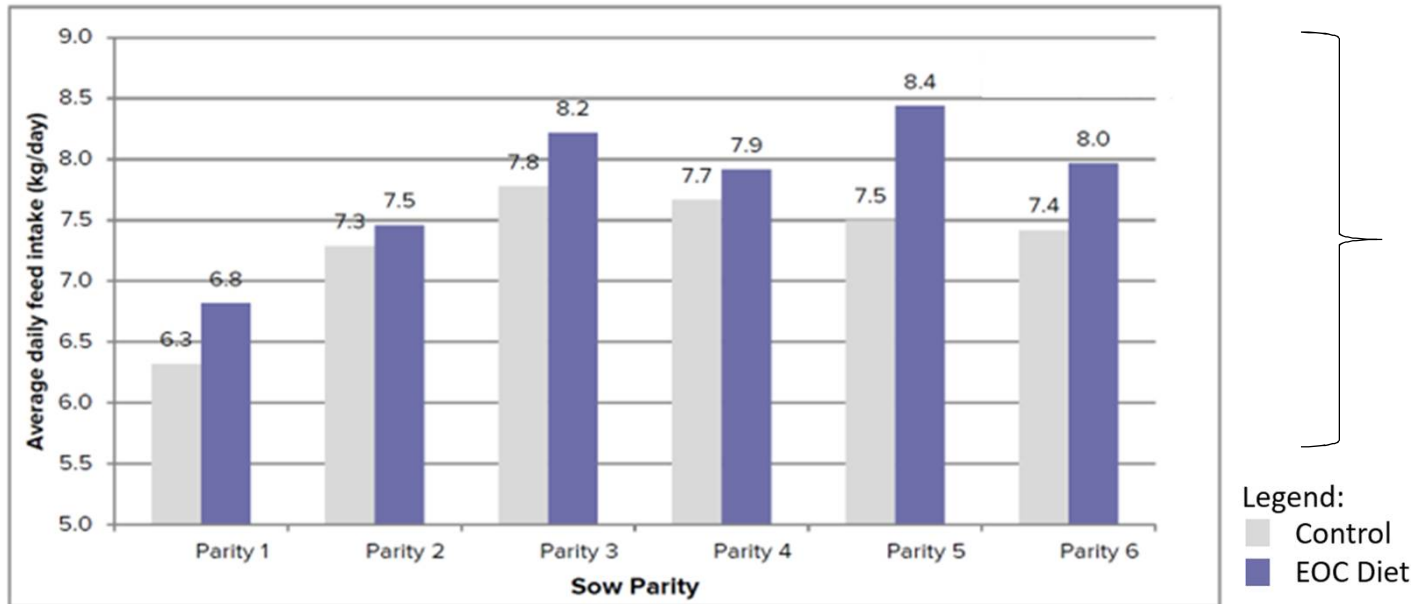
# Manage Sows to increase litter size born alive, total litter birth weight and total litter weaning weight.

Enhancing fertility, reducing still birth and pre-weaning mortality are critical to increase sow productivity.

Printing effect of essential oil.

Feeding sows with organoleptic enhancers to improve piglet feed intake.

Fig 7. The result of Essential Oils Compounds on lactation feed intake .



Source: Cargill Additive Team 2018



# Manage Sows to increase litter size born alive, total litter birth weight and total litter weaning weight.

*Enhancing fertility, reducing still birth and pre-weaning mortality are critical to increase sow productivity.*

Completing the link between essential oil combinations use in sows and piglets: organoleptic imprinting

phenomenon whereby piglet's feed intake is improved by including a flavor in the diet of the sow, which is subsequently transmitted to the piglets via amniotic fluid and later via sows milk.

Then including the same flavor in the creep diet of the piglets, the feed intake of the piglets is stimulated.

	Exposed Sows <sup>1</sup>	Unexposed Sows <sup>1</sup>	P-value
No. of Litters	11	10	
Creep Feed per Piglet	344	282	
Creep feed preference <sup>2</sup>	1.13	0.80	0.04

1. Imprinting = Exposed (sows fed essential oil combinations) or unexposed (sows not fed with essential oil combination)

2. Ratio of consumption of essential oil combination flavoured creep feed to unflavoured creep feed

Source: Cargill



# Managing piglets produced by highly productive sows

*the management objective is to get more live, heavier and healthier pigs throughout the nursery phase and get them up for success to market.*

## **Common Piglet Related Challenges in the Philippines.**

1. Switch from sow milk to solid feed
2. Weaning Stress
3. Uniformity
4. Weak piglets
5. Digestive Health and Scouring
6. Low Feed Intake



# Managing piglets produced by highly productive sows

Key management objective is to get more live, heavier and healthier pigs throughout the nursery phase and get them up for success to market.

## Optimal Nutrition.

Provide the right nutrient for each life stage of piglet to increase feed intake and increase higher uniformity.

Enzyme Production of Piglets from birth to Week 7

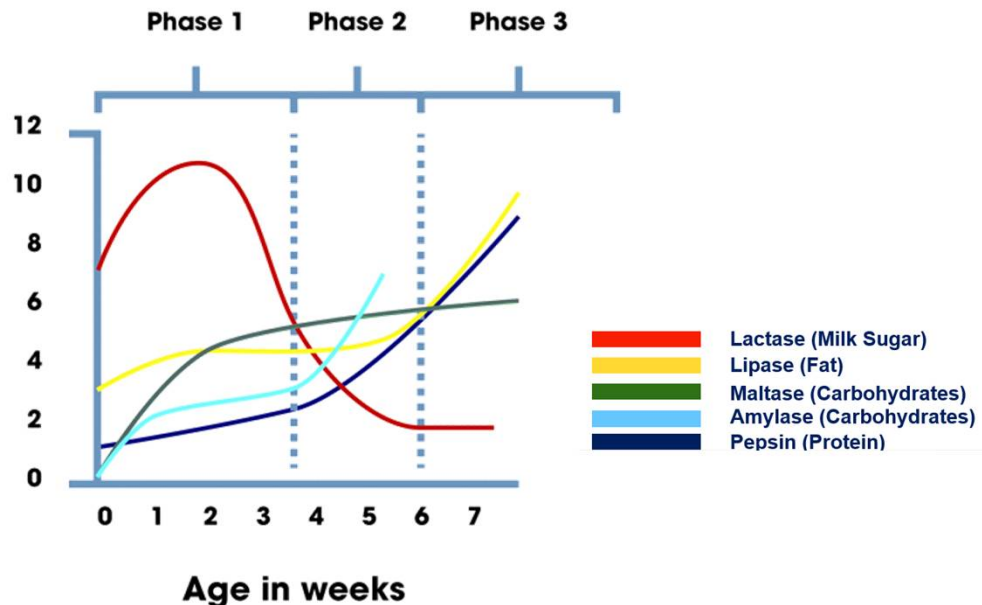
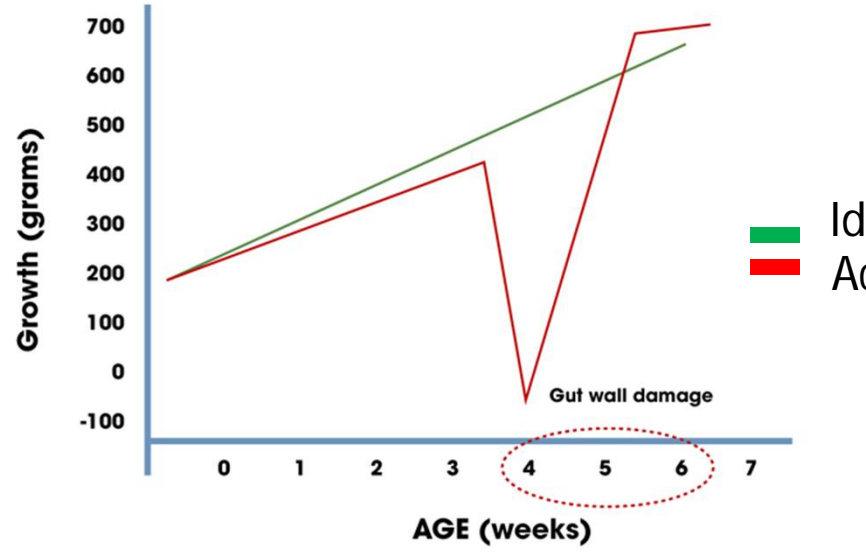


Fig 9. Piglet Growth Curve from Birth to Week 7



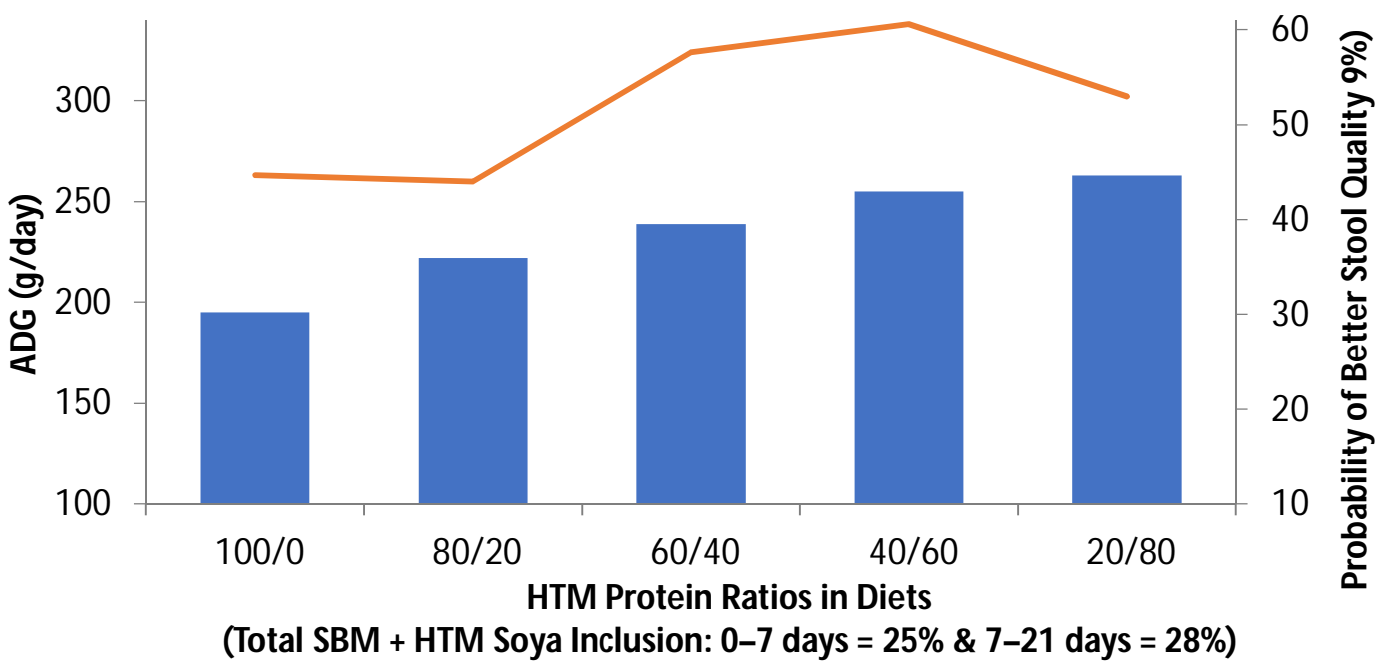


# Managing piglets produced by highly productive sows

Key management objective is to get more live, heavier and healthier pigs throughout the nursery phase and get them up for success to market.

HTM - Thermo Mechanically Processed Vegetable Protein improves digestibility and gut health from low protein fermentability.

Fig 10. Impact of HTM Protein to Piglet ADG & Stool Quality



**\*The Challenge:**  
 Weaning age ~ 21days and weight ~ 1.1 kg. With many animals having diarrhea (~4kg). Many veterinary treatments are used primarily for lameness (Prinabol), Strep), lethargy, and some diarrhea. Diarrhea was not always a real challenge in the nursery phase and it was attempted to only medicate all pigs.

ADG Linear P=0.011  
 Stool Quality Linear P=0.001



Source: Cargill Research, 2020 -ELK\_SN1914

# Managing piglets produced by highly productive sows

Key management objective is to get more live, heavier and healthier pigs throughout the nursery phase and get them up for success to market.

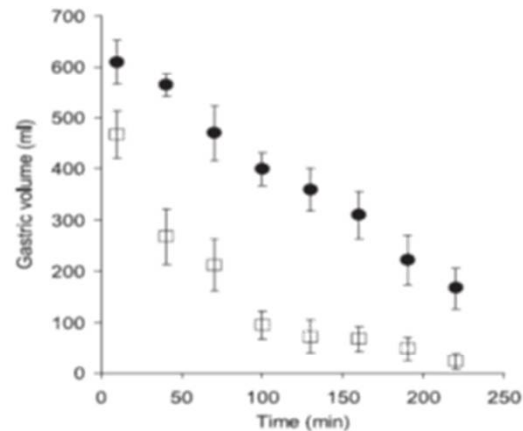
Diet Processing to Package Fat in Cereals improves Feed Intake.

## Gastric fat layering



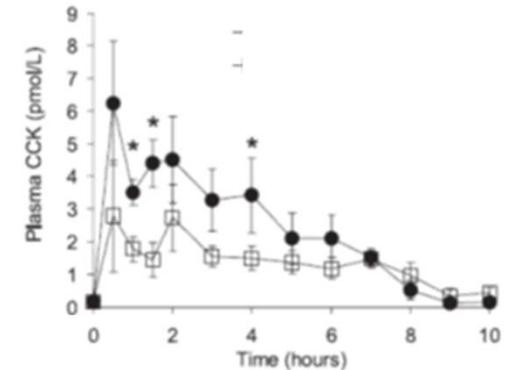
How is diet lipid delivery impact emulsions in the stomach?

## Gastric emptying



How can diet preparations optimize post-prandial energy delivery to the intestine during the weaning transition?

## Satiety signals



How can lipids be delivered to promote more pro-feed intake satiety signals?



Adapted from Marciani et al. 2007 and Malja

# Managing piglets produced by highly productive sows

Best management objective is to get more live, heavier and healthier pigs throughout the nursery phase and get them up for success to market.

## Special Processing to Package Fat in Cereals improves Performance.

Special processing of cereal with added oil increased end of nursery body weight by 1 kg at 63 days of age

Fig 11a. Effect of Packaged Fat in Cereal to Newly Born Piglets

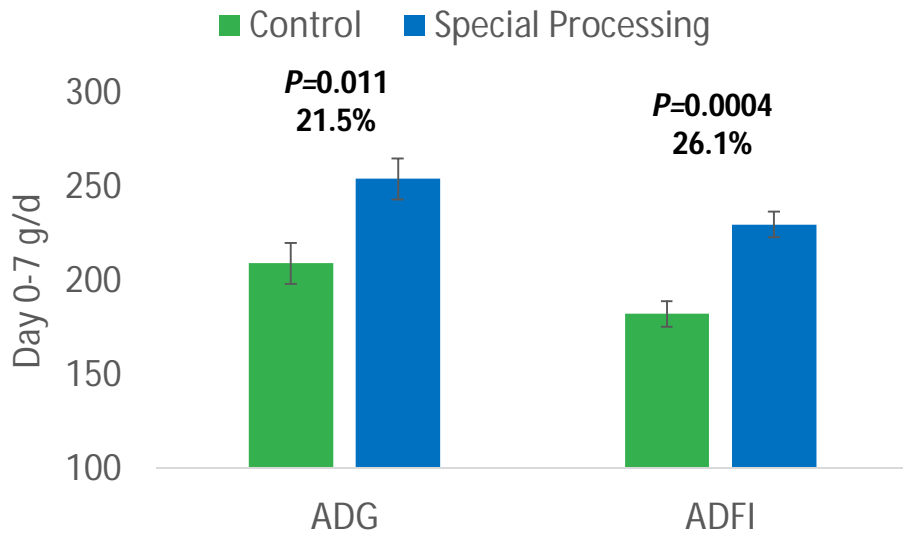
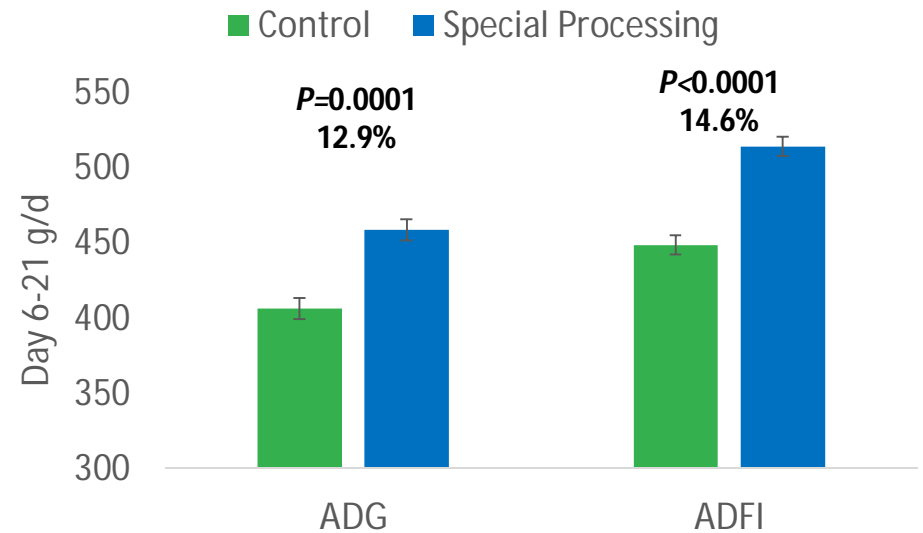


Fig 11b. Effect of Packaged Fat in Cereal to Suckling Piglets



NP1705, 2017, NL. Experimental diets were fed for 42 days. Added Oil to the diet was 4% and was delivered either as added oil or via special processing

## **Conclusion and Recommendation:**

**The Philippine swine repopulation can be sped up through:**

1. Increasing sow productivity by additional LSBA with heavier birth weight, lower mortality and higher weaning weight.
2. High performing piglets with higher uniformity

# Local Feeding Trials & Results

Breeders

Philippines



# Local Trial Conducted in Visayas

Sample Size: 547 Sows (12 Batches)

Period Conducted: 1<sup>st</sup> half of 2023

Table 4. Actual Trial Results of Different Sow Batches in Achieving LSBA and LBW.

Batch	No. of Sows	Total Piglets Born (head)	Total Piglets Born Alive (head)	LBW/Ave Litter Size Born (head)	LBW/Ave Litter Size Born Alive (head)	Average of BirthWeight (kg)	BW / Ave Litter Birth Weight (kg)	S
1	40	560	517	14.0	12.9	1.3	16.8	
2	57	778	715	13.6	12.5	1.4	17.3	
3	51	762	700	14.9	13.7	1.3	17.7	
4	13	172	158	13.2	12.2	1.5	17.9	
5	13	167	159	12.8	12.2	1.5	18.0	
6	57	757	683	13.3	12.0	1.4	17.0	
7	47	655	608	13.9	12.9	1.4	18.0	
8	72	957	878	13.3	12.2	1.6	19.3	
9	59	864	791	14.6	13.4	1.4	18.8	
10	56	777	721	13.9	12.9	1.4	18.1	
11	58	898	822	15.5	14.2	1.3	18.9	
12	24	362	331	15.1	13.8	1.4	19.5	
<b>Total / Ave</b>	<b>547</b>	<b>7,709</b>	<b>7,083</b>	<b>14.0</b>	<b>12.9</b>	<b>1.4</b>	<b>18.1</b>	



# Local Trial Conducted in Luzon

Sample Size: 72 Sows (4 Batches)

Period Conducted: 1<sup>st</sup> half of 2023

Table 5. Actual Trial Results of Different Sow Batches in Achieving Total LWW.

Parameters	Target	July Actual Performance				Total / Average
		Batch 9	Batch 10	Batch 11	Batch 12	
Sow		18.0	18.0	18.0	18.0	72.0
Piglets		285.0	279.0	275.0	290.0	1,129.0
Ave Weaning Litter Size	13	15.8	15.5	15.3	16.1	15.7
Weaning Age		28.0	28.0	29.0	29.0	28.5
Pre-Weaning Mortality		2.0	3.0	2.0	4.0	2.8
% Mortality	5%	1%	1%	1%	1%	1%
Weaning Weight	7	8.1	8.2	8.0	9.1	33.4
Total Weaning Weight	80	127.8	127.6	122.1	146.6	131.0



# Local Feeding Trials & Results

Piglet

Philippines





# Local Trial Conducted in Visayas

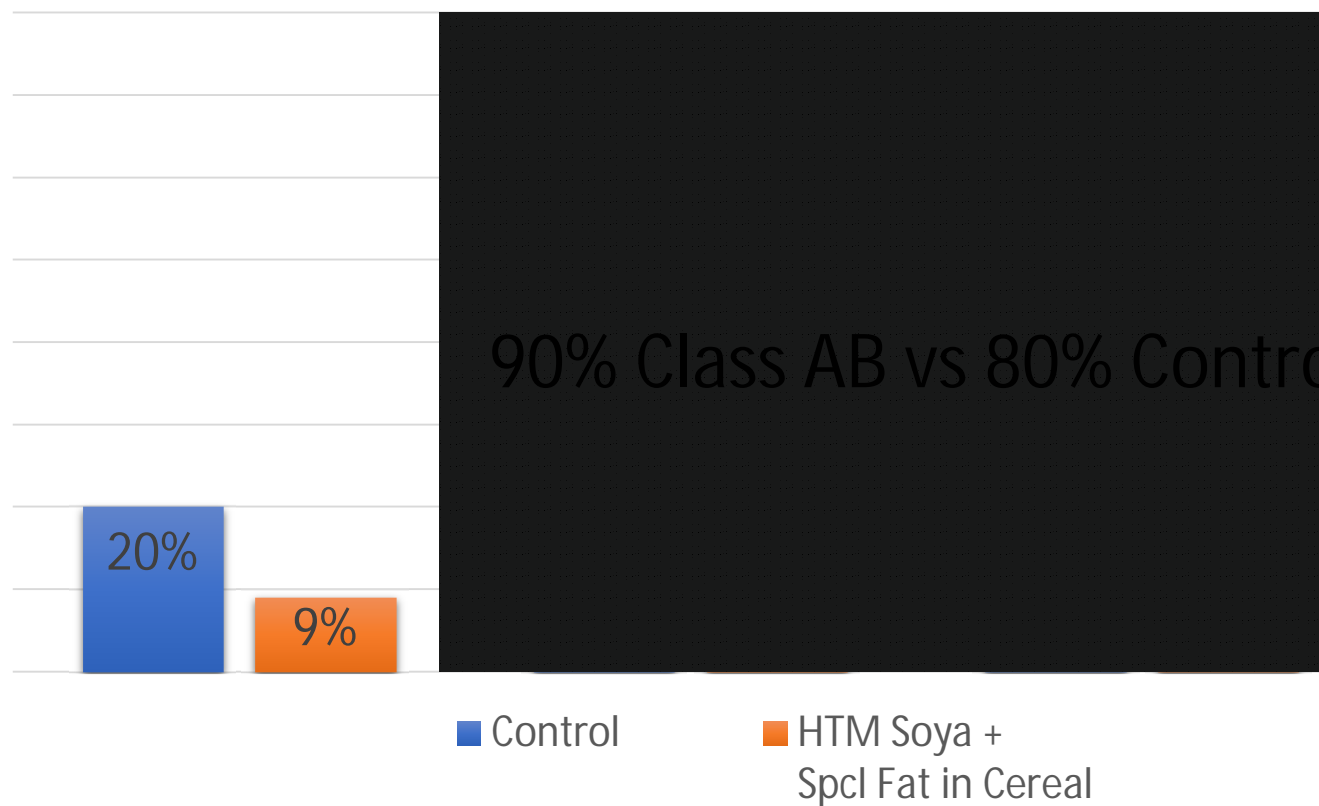
Sample Size: 700 Piglets

Period Conducted: 2<sup>nd</sup> Half of 2022

Piglet Classification at Day 70

Weight (kg)	Control	HTM Soya + Special Packaged Fat in Cereal
> 10.0	20%	9%
7.0 - 10.0	64%	69%
< 7.0	16%	22%

Fig. 12. Piglet Classification at Day 70



## **Conclusion and Recommendation:**

**The Philippine swine repopulation can be sped up through:**

1. Increasing sow productivity by additional LSBA with heavier birth weight, lower mortality and higher weaning weight.
2. High performing piglets with higher uniformity