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Managing and feeding the modern sow:
Brazilian industry perspective

Rafael Kummer
Master Agroindustrial

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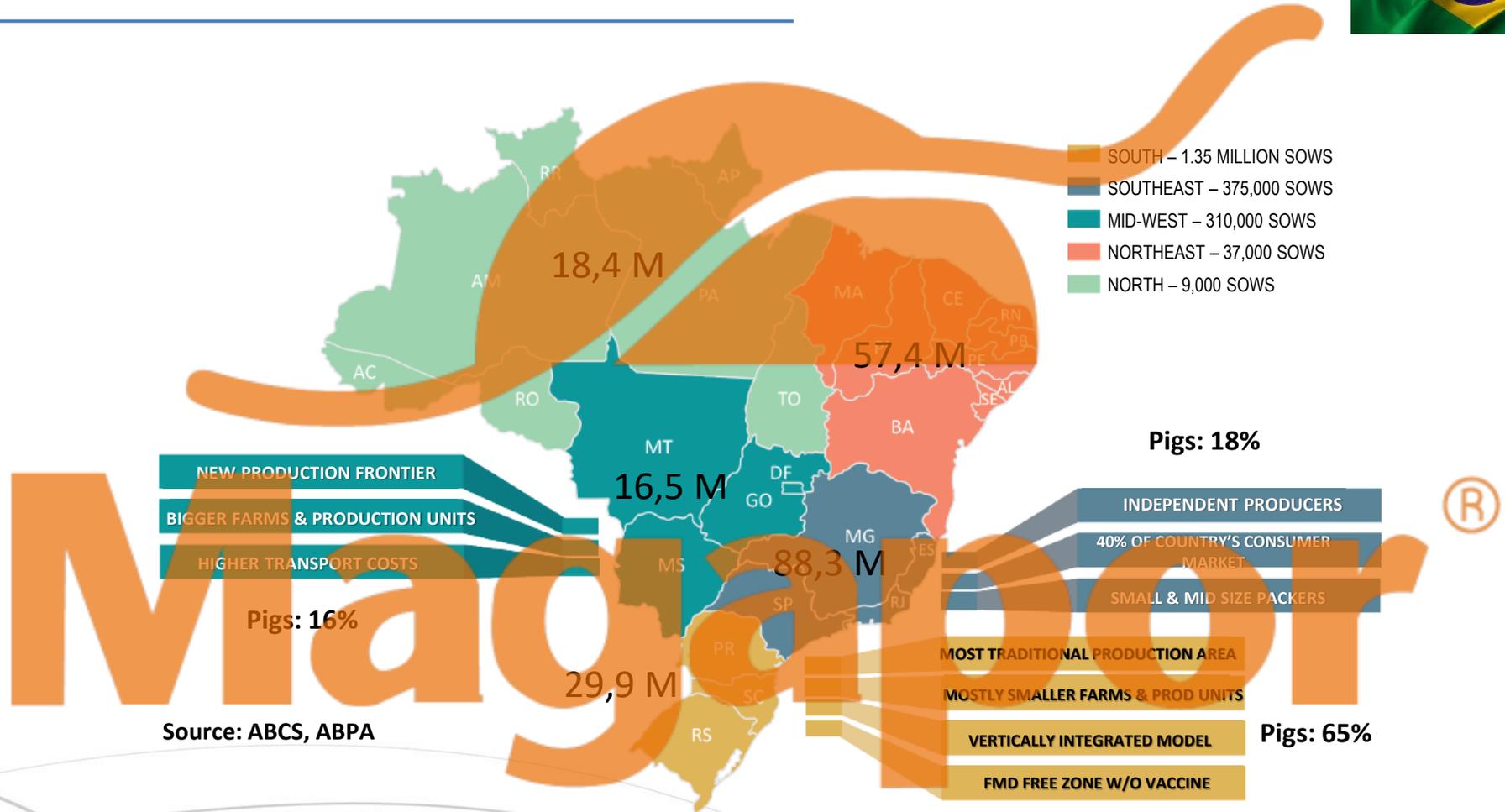


Vall Companys
GRUPO



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Brazil Pig Production (2,1 M sows) and Population (212 M)



Source: ABCS, ABPA



Master - Overview

- Foundation, 1994 – Videira, SC.
- 2400 employees
 - 350 “agro”
- 38.000 sows own - 8 units
- 2 nucleos (3.000 pure line sows)
- 2 boar studs (150 boars)
- 3 feed mills (own feed)
- 326 Partners (550.000 spaces)
- Internal R&D
- 2024 – 1,2 M pigs weaned



Master Production – Key drivers

- ✓ Only pigs
- ✓ Live hogs / internal market / exportation
- ✓ Efficiency – total control of production (verticalized);
- ✓ Multiple sites / no mix flows;
- ✓ Food safety / Meat quality;
- ✓ Never stop improving – Technologies, R&D;
- ✓ Cost of production;



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Master Agroindustrial – 10 y summary

	2014	2024
	Overall	
Pigs weaned	822.969	1.129.192
Site 1 (kgs feed)	43,4	36,4
Site 2 – FE (kgs/kg)	1,66	1,63
Initial weight (kgs)	5,85	6,01
Feed S2 (22 – initial weight *CA)	27,4	26,0
CA finisher (22-125)	2,46	2,28
Finisher feed	253,4	234,8
Kgs of feed 125 kgs	324,2	297,2
FE 125 kgs	2,59	2,37
Growth Rate site 2 (g/day)	0,323	0,348
Growth Rate finisher (g/day)	0,917	0,994
Slaughter weight (kgs)	119,2	122,8
Finisher mortality	3,2%	2,2%
Born Alive	12,6	14,7
Wean/sow/year	26,8	31,4

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Master Agroindustrial – 10 y summary

Amount of feed usage

	2014	2024	%
Gestation feed (kgs)	22.927.760	28.162.770	22,8%
Lactation feed (kgs)	10.691.670	14.240.370	33,2%
Total sows (G+S)	33.530	41.394	23,5%
Gestation/sow/year (kgs)	684	680	-0,5%
Lactation/sow /year(kgs)	319	344	7,9%
Total feed/sow/year (kgs)	1.003	1.024	2,2%

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Modern sow (2025)

- Leaner;
- Pen gestation;
- 30% > 18 TB and wean >100 kgs;
- Must milk and wean good pigs;
- Most sows wean more pigs than # viable teats
- Labor



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	0	1	2	3	4	5	6	7	8	SOM
PERFORMANCE PARTOS									<null>	
Partos	0	616	519	440	377	295	250	199	526	3222
% Partos	0.0	19.1	16.1	13.7	11.7	9.2	7.8	6.2	16.3	100.0
% ninhadas com menos de 7 nascidos	0	1.8	7.1	2.3	2.1	1.4	2.8	3.0	1.0	2.7
Med. parto paridas	0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	9.5	4.3
Total nascidos por parto	0	16.2	14.9	16.8	17.5	18.4	17.8	17.8	17.7	16.9
Nascivos por parto	0	14.8	13.9	15.5	16.0	16.7	16.1	16.1	15.7	15.4
Natimortos por parto	0	0.6	0.6	0.8	0.9	1.0	0.9	0.9	1.2	0.8
% Natimortos	0	3.7	3.8	4.9	5.1	5.2	5.3	5.0	6.5	4.9
Mumificados por parto	0	0.7	0.4	0.5	0.7	0.7	0.7	0.9	0.9	0.7
% Mumificados	0	4.4	2.9	2.8	3.9	4.0	4.0	4.9	4.9	3.9
% gestação presumida (coorte parto)	0	96.6	91.3	95.3	97.3	94.4	96.3	97.2	96.9	95.5
Taxa de partos	0	87.9	83.3	89.2	93.1	91.3	92.3	92.1	91.6	89.4
Taxa ajustada de parto	0	93.2	89.8	95.9	97.2	97.4	98.4	97.5	97.4	95.1
	0	114.8	115.3	115.3	115.3	115.3	115.3	115.3	115.2	115.2



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Modern sow (2025)

Stay longer and are more productivity (old parities)

R&D – Focus on nutrition/feed efficiency (15 y)

1 – Weaning age;

2 - Impact of replacement gilt birth weight on performance/longevity;

3 – Gilt growth rate x performance;

4 – Feeding gilts;

5 - Weaning to estrus interval feeding;

6 – Gestation feeding;

7 - Impact of gilts raised in pens or crates during gestation vs. individual weight

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R&D – Focus on nutrition/feed efficiency – weaning age

HOUSING AND MANAGEMENT

Impact of increasing weaning age on pig performance and belly nosing prevalence in a commercial multisite production system

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Abstract

The effects of increasing weaning age in a commercial production system on nursery and finishing performance were evaluated. A total of 1,176 pigs (PIC 337 × Camborough) were used in a 136-d growth trial with 14 and 10 replications/ weaning age on the nursery and finishing phases, respectively. Treatments included weaning litters at 19, 22, 25, or 28 d of age. In the nursery, as weaning age increased, initial (5.04, 5.70, 6.52, and 7.26 kg) and final body weight (BW) (18.2, 19.8, 23.0, and 25.1 kg) increased (linear, $P < 0.001$). Increasing the weaning age reduced (linear, $P < 0.001$) the prevalence of pigs exhibiting belly nosing (27.6%, 15.0%, 6.5%, and 1.4%) during the first 3 wk. The percentage of pigs losing weight during the first week after weaning (35.1%, 28.7%, 12.4%, and 9.2%) decreased (linear, $P < 0.001$) as weaning age increased. Average daily gain (ADG; 295, 320, 374, 406 g/d) and average daily feed intake (493, 534, 619, 661 g/d) increased (linear, $P < 0.001$), while feed

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R&D – Focus on nutrition/feed efficiency – weaning age

- ✓ Weaning age 19 / 22 / 25 / 28
- ✓ Farrowing / nursery / finisher performance
- ✓ Morbidity / mortality
- ✓ Economic evaluation

- ✓ Best results around 22d

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R&D – Focus on nutrition/feed efficiency – replacement gilts birth weight



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R&D – Focus on nutrition/feed efficiency – replacement gilts birth weight

Class	Weight Classes	n	Percentual	Birth Weight (g)
				LS means ± SEM
1	410 - 990 g	193	12.91%	828.5 ± 9.59
2	1000 - 1160 g	185	12.37%	1086.3 ± 3.60
3	1170 - 1280 g	190	12.71%	1232.2 ± 2.59
4	1290 - 1390 g	186	12.44%	1344.9 ± 2.22
5	1400 - 1500 g	195	13.04%	1449.6 ± 2.34
6	1510 - 1610 g	176	11.77%	1562.4 ± 2.36
7	1620 - 1770 g	184	12.31%	1685.9 ± 3.34
8	1780 - 2400 g	186	12.44%	1945.2 ± 10.62
Total		1495	100%	

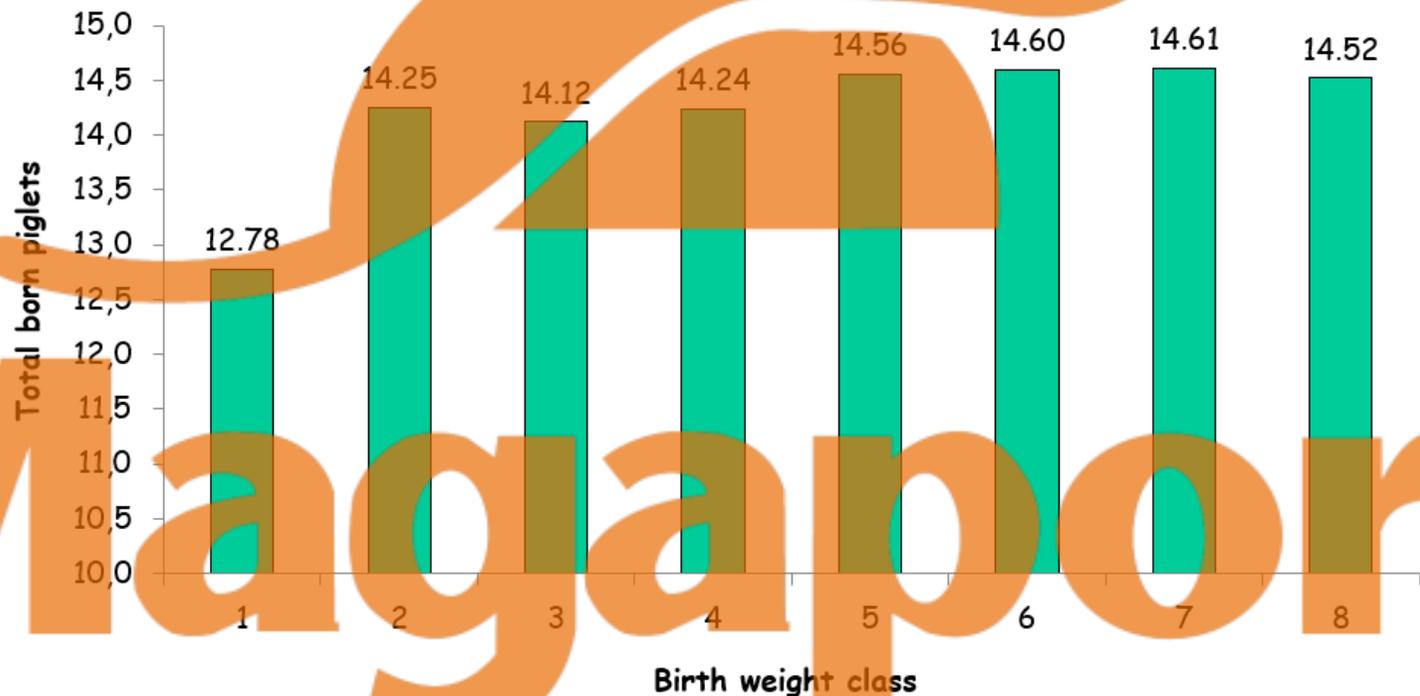
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R&D – Focus on nutrition/feed efficiency – replacement gilts birth weight

Number of total piglets born at first farrowing (n = 673)
according to the birth weight of swine females

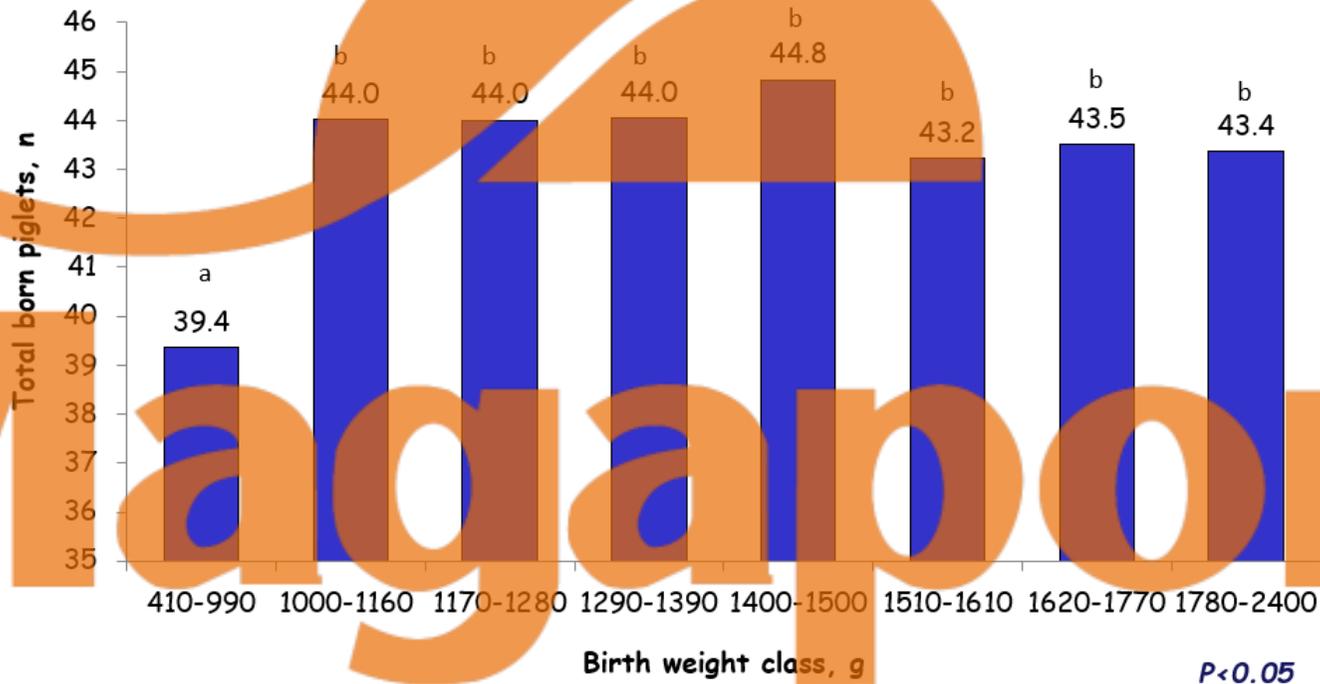


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R&D – Focus on nutrition/feed efficiency – replacement gilts birth weight

Number of total piglets born over three parities
(n = 497) according to the birth weight of swine females



R&D – Focus on nutrition/feed efficiency – replacement gilts birth weight

Conclusions:

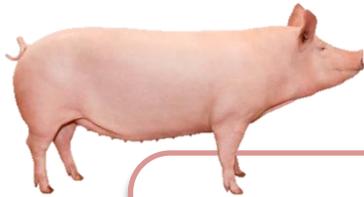
The findings suggest that selecting gilts based on their birth weight can help reduce costs in pig farming.

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R&D – Focus on nutrition/feed efficiency – **gilt growth rate**



#3301 1050s

G1 >480 - ≤530g/d (n = 800)

G2 >530 - ≤580g/d (n = 978)

G3 >580 - ≤630g/d (n = 916)

G4 >630 - ≤810g/d (n = 608)



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R&D – Focus on nutrition/feed efficiency – gilt growth rate

Performance until 3rd farrowing of gilts with different average daily gain from birth to selection for entry in the breeding herd

Variables	G1 (n= 800)	G2 (n= 978)	G3 (n= 916)	G4 (n= 607)	SEM	P-value
Age at selection, d	162.2	162.5	162.5	162.7	0.72	0.1665
Weight at selection, kg	82.4a	90.1b	98.1c	108.4d	0.43	<0.0001 [®]
ADG at selection, g/d	507.9a	554.8b	604.0c	666.8d	0.77	<0.0001
Age at 1 st mating, d	219.2a	216.6b	214.8c	213.2c	0.71	<0.0001



R&D – Focus on nutrition/feed efficiency – gilt growth rate

	G1 (n=169)	G2 (n=232)	G3 (n=204)	G4 (n=136)	P value
Breeding age	219,1±0,7a	216,6±0,6b	214,8±0,7c	213,2±0,7d	<0,0001
Weight, kg	131,6±1,1a	135,0±1,0b	139,8±1,0c	147,4±1,1d	0,0001
1st FR, %	95,2 ab	94,1 b	96,2 a	96,8 a	0,0605
1st TB	14,4	14,5	14,5	14,6	0,5222

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Walter, 2018[®]



R&D – Focus on nutrition/feed efficiency – gilt growth rate

Performance until 3rd farrowing of gilts with different average daily gain from birth to selection for entry in the breeding herd

Variables	G1 (n= 800)	G2 (n= 978)	G3 (n= 916)	G4 (n= 607)	SEM	P-value
1 st farrowing rate, %	95.2ab	94.1b	96.2a	96.8a	0.79	0.0605
TBP 1 st farrowing	14.4	14.5	14.5	14.6	0.12	0.5222
2 nd farrowing rate, %	91.1	90.4	92.5	92.2	1.15	0.4278
TBP 2 nd farrowing	13.6	14.0	13.9	13.7	0.16	0.2876
3 rd farrowing rate, %	93.2	93.2	91.7	92.3	1.27	0.6523
TBP 3 rd farrowing	15.1	15.0	15.1	14.9	0.17	0.6391

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R&D – Focus on nutrition/feed efficiency – gilt growth rate

Conclusions:

- ✓ More important breeding weight than GR at selection
- ✓ Low GR gilts at selection showed a higher GR after selection
- ✓ No advantages in breeding heavier gilts

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R&D – Focus on nutrition/feed efficiency – late gestation (>90d)

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Impact of feed intake during late gestation on piglet birth weight and reproductive performance: a dose-response study performed in gilts

André L Mallmann, Elisar Camilotti, Deivison P Fagundes, Carlos E Vier, Ana Paula G Mellagi, Rafael R Ulguim, Mari Lourdes Bernardi, Uislei A D Orlando, Márcio A D Gonçalves, Rafael Kummer, Fernando P Bortolozzo ✉

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<https://doi.org/10.1093/jas/skz017>

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R&D – Focus on nutrition/feed efficiency – late gestation (>90d)

Females were weighed individually and randomly assigned into four feeding levels from D90 of gestation to farrowing

977 gilts

1.8 kg/day

10.8 g SID/Lis
5.74 Mcal

2.3 kg/day

13.8 g SID/Lis
7.34 Mcal

2.8 kg/day

16.8 g SID/Lis
8.93 Mcal

3.3 kg/day

19.8 g SID/Lis
10.53 Mcal

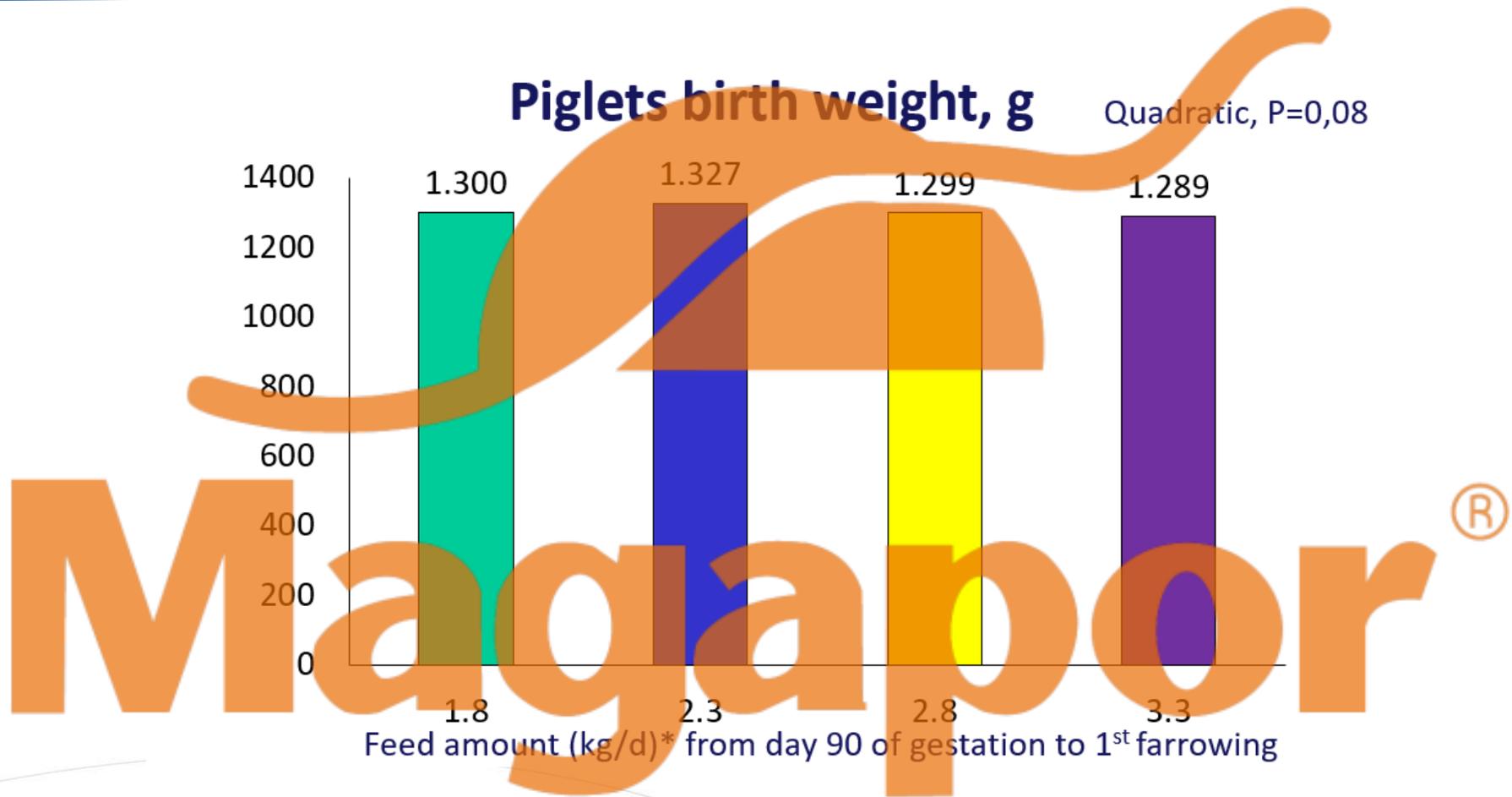
2.5 kg/day NRC

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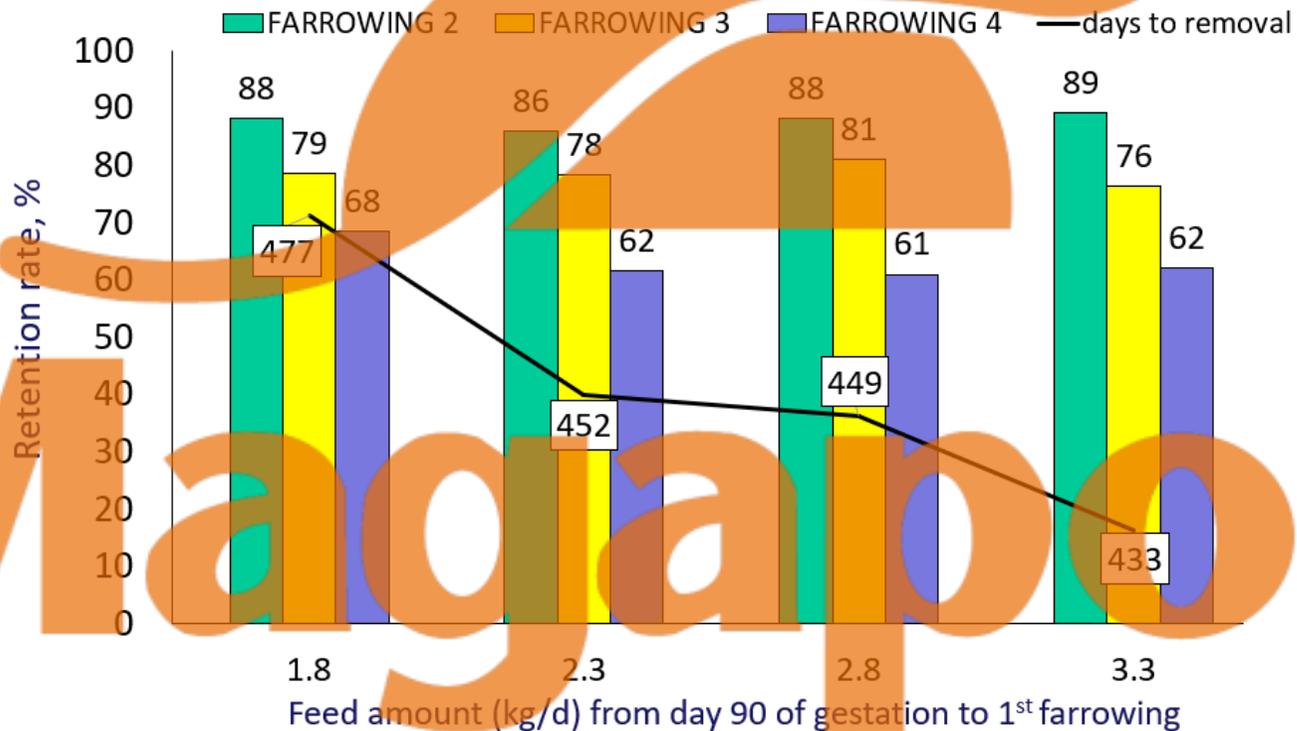
R&D – Focus on nutrition/feed efficiency – late gestation (>90d)



R&D – Focus on nutrition/feed efficiency – late gestation (>90d)

Retention rate and days to removal

Retention rate farrowing 4, Linear P = 0.1398 Days to removal, Linear P = 0.1197



R&D – Focus on nutrition/feed efficiency – late gestation (>90d)

Conclusions

- ✓ Increased sow weight
- ✓ No impact on piglet birth weight
- ✓ No impact on weaning weight
- ✓ No impact on retention rate / subsequent performance

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R&D – Focus on nutrition/feed efficiency - >70 d gestation

Feed increase after 70 d of gestation on birth weight / mammary gland / # pigs wean
Zanin, 2024

T1 Control
70 – 90 d: 1,8 kgs/d
91d - farrow: 2,0 kgs/d

T2 Increase
70 – 90d: 2,5 kgs/d
91d - farrow: 3,0 kgs/d

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R&D – Focus on nutrition/feed efficiency - >70 d gestation

	Control	Feed Increase >70d	<i>p value</i>
Caliper (112d)	12,9	14,1	<0,001
BCS (112d)	3,01	3,27	<0,0001
BF (mm) (112d)	11,5	12,7	<0,001
Weight after farrowing	223,2	233,4	<0,0002
D20 lactation			
Caliper	11,9	12,7	0,003
BCS	2,86	2,96	0,012
BF (mm)	10,3	11,1	0,014
Weaning weight	226,9	232,1	0,092

Magapor [®] Zanin, 2024

	Tratamentos		<i>p value</i>
	Controle (n=100)	Bump Feeding (n=98)	
Peso médio (kg)	1,407 ± 0,03	1,38 ± 0,03	0,42
CV (%)	21,39 ± 0,06	22,72 ± 0,06	0,15
% leitões <= 800g	8,07 ± 0,07	8,97 ± 0,69	0,36
% leitões <= 1000g	18,67 ± 1,64	18,49 ± 1,62	0,90



R&D – Focus on nutrition/feed efficiency – Weaning to estrus

Effects of different amounts and type of diet during weaning-to-estrus interval on reproductive performance of primiparous and multiparous sows

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➤ Factorial 2 × 2 × 2 (1060 sows)

- Amount: 2,7 vs. 4,3 kg/d;
- Diet: Gest vs. Lact;
 - **Gest:** 13.67 MJ/kg EM; PB 13.58%; Lis: 0.62%
 - **Lact:** 14.34 MJ/kg EM; PB 19.18%; Lis: 1.20%
- Parity: OP1 vs. OP2+

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R&D – Focus on nutrition/feed efficiency – Weaning to estrus



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R&D – Focus on nutrition/feed efficiency – Weaning to estrus

Results: No difference

- ✓ Weaning to estrus interval
- ✓ Anoestrus rate
- ✓ Farrowing rate
- ✓ Total Born
- ✓ Folicle development

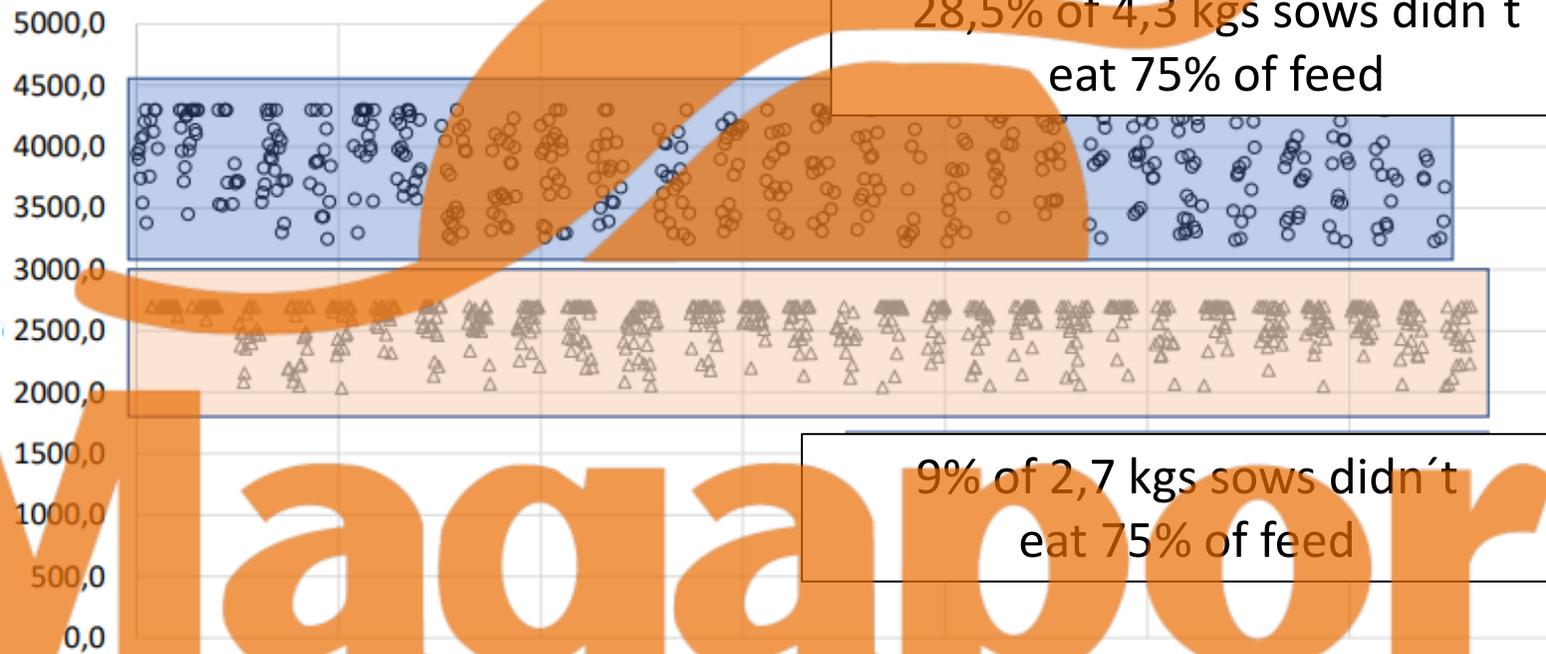
Gianlupi, 2020

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R&D – Focus on nutrition/feed efficiency – Weaning to estrus



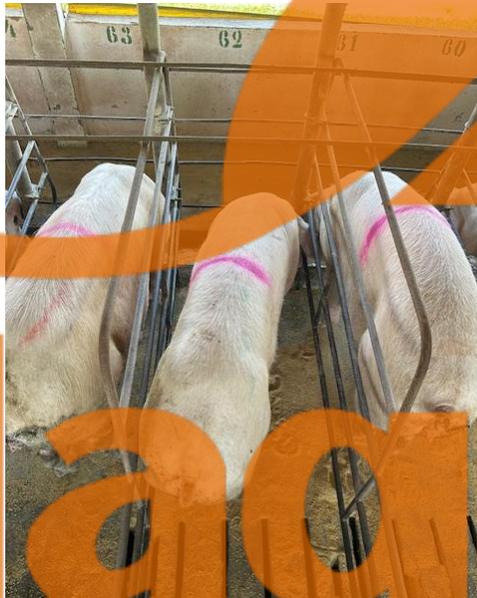
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△ 2,7 ○ 4,3



R&D – Focus on nutrition/feed efficiency – **gilt development (pens vs. crates)**

On going...
Gilts in pens or crates after 40d of gestation



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R&D – Focus on nutrition/feed efficiency – gilt development (pens vs. crates)

Average gilt weight (kgs) based on gestation crate or pen after 40d after breeding

	#	Breeding weight	Weight 40d	Weight 112d
Crates				
a (<130 kgs)	289	123,3	156,1	196,4
b (130 - 140 kgs)	181	135,2	162,3	201,2
c (>140 kgs)	222	148,3	169,9	209,4
Pens				
a (<130 kgs)	154	124,2	153,2	185,8 [®]
b (130 - 140 kgs)	202	135,5	161,8	197,0
c (>140 kgs)	185	148,5	171,0	204,0

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Take home

Managing and feeding the modern sow



- Need to be efficient (<0,9 U\$/kg);
- Sow are different today;
- Strategic decisions;
- Focus inside – keep improving
- Importance of partners;
- People

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THANKS
GRACIAS

Rafael Kummer

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