SUPPLEMENTS, ADDITIVES, AND BIO-SECURITY MITIGANTS FOR BREEDING HERDS

繁殖群的营养补充剂、添加剂和生物安全缓解剂

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THERE ARE TWO TIMES IN PIG FEEDING WHERE IT IS A BAD TIME TO TRY TO SAVE MONEY!
在养猪时两个阶段为了省钱是一个不好的时机！
WEANED PIGS AND LACTATING SOWS
断奶猪和泌乳母猪

- Ingredient decisions are not easy 成分决定并不容易
  - Complexity of lactation diets 泌乳日粮的复杂性
  - 18 ingredient categories 18个成分类别
  - >100 ingredient choices >100成分选择
- Sow research is difficult to execute and data is limited
- 母猪的研究难以执行，数据也很有限
- But, the value of the sow, reproduction, and the pig are very important to profitability
- 但是，母猪、繁殖和猪的价值对盈利能力非常重要

SUPPLEMENTS FOR SOW HEALTH AND PRODUCTION 用于母猪健康和生产的添加剂

- Fiber纤维
  - GI health benefits
  - 胃肠道健康益处
  - 500-600 g per day
  - 每天500-600克
- Amino acids 氨基酸
  - Essential – not top 4
  - 基本-而不是前4名
    - Valine 缬氨酸
    - Isoleucine 异亮氨酸
    - Histidine 组氨酸
  - Conditional 有条件
    - Arginine 精氨酸
    - Glutamine 谷氨酰胺
- Fatty acids脂肪酸
  - Essential fatty acids
  - 必需脂肪酸
    - Alpha linolenic α-亚麻酸
    - Linoleic 亚油酸
- Trace minerals 微量矿物
  - Increased zinc 锌含量增加
  - Available iron 可用铁
- Vitamins 维生素
  - Vitamin C 维生素C
- Anti-inflammatories
- 抗炎药

ADDITIVES 添加剂

- Phytase 植酸酶
  - Feed intake, litter weaning weights and pig survival
  - 采食量、断奶重量和猪存活率
- Carbohydrase(s)
- 碳水化合物
  - Enzymes increase the energy availability in fiber-containing diets
  - 酶增加了含纤维饮食中的能量可用性
  - Xylanase 木聚糖酶
  - α-Galactosidase α-半乳糖苷酶
  - Cellulase 纤维素酶

- Probiotics: 益生菌：
  - Source and strain differences 来源和菌株差异
- Bacteria 细菌
  - Impact on the sow
  - 对母猪的影响
    - ADFI 猪的日采食量
  - Impact on the pig
  - 对猪的影响
    - Immune enhancement
    - 免疫增强
    - Altered gut microbiota
    - 肠道微生物群改变

EFFECTS OF HIGHER LEVELS OF SOY PROTEIN AND METHIONINE ON PERIPARTURIENT HEALTH OF SOWS

高水平大豆蛋白和蛋氨酸对母猪围产期健康的影响

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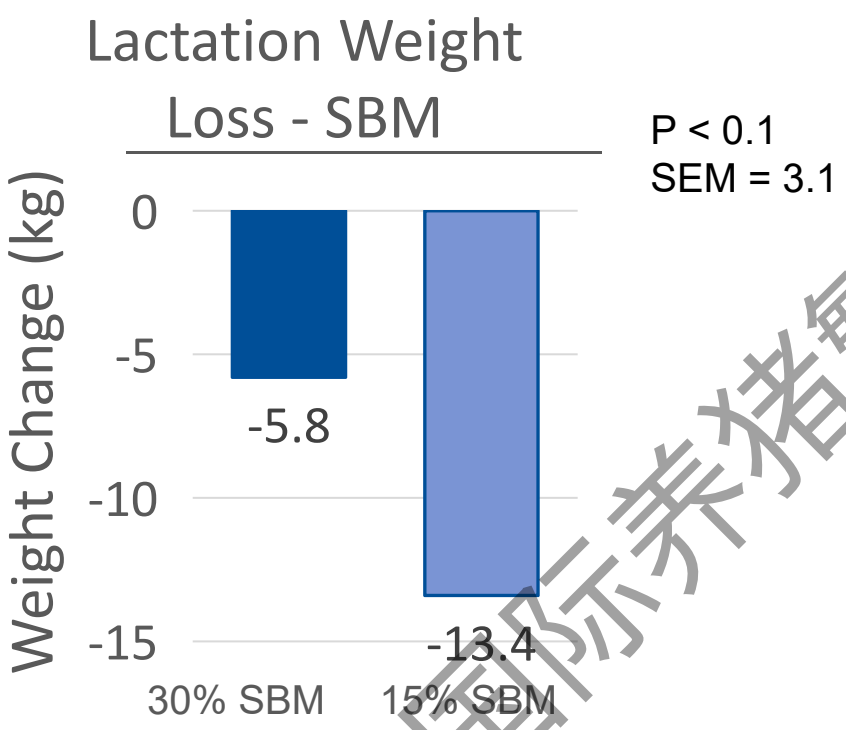
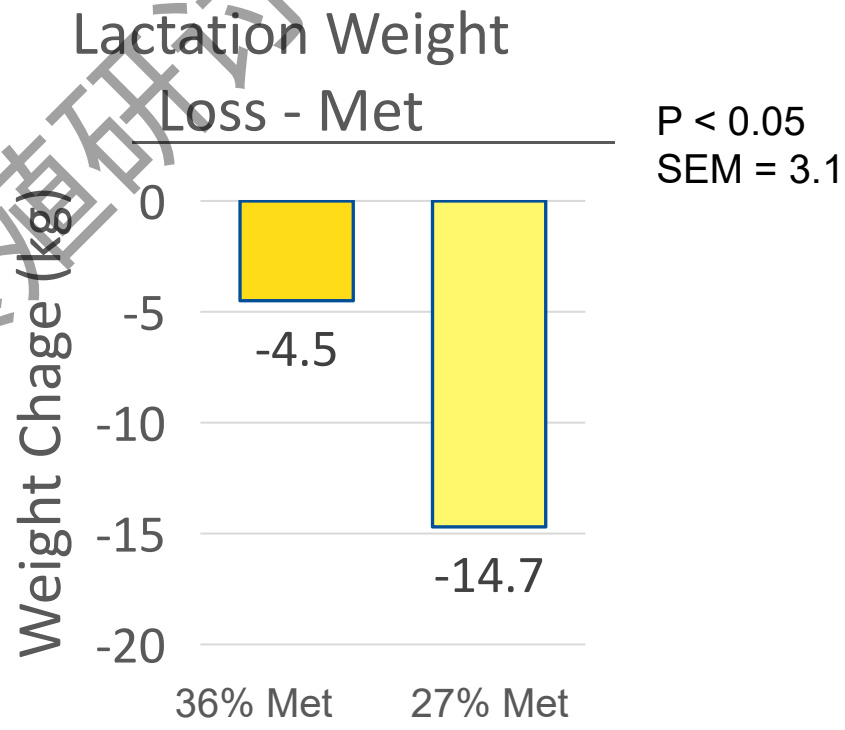
EFFECTS OF SOY PROTEIN AND METHIONINE ON WEIGHT LOSS 大豆蛋白和蛋氨酸对减重的影响



P < 0.1
SEM = 3.1



P < 0.05
SEM = 3.1

PHYTASE INCLUSION INCREASES LITTER GROWTH 植酸酶的加入增加了窝仔猪的生长

Table 1. Effect of high phytase supplementation in lactation diets on sow and litter performance[1]

	Phytase, FYT/kg[2]				Probability, *P* =	
	0	1,000	3,000	SEM	Linear	Quadratic
Sows, n	36	36	37	--	--	--
Sow body weight change, kg (farrow to wean)	-10.5	-10.6	-10.6	1.64	0.943	0.943
Sow ADFI[3], kg						
d 107 to farrow[4]	2.2	2.4	2.3	0.06	0.112	0.009
d 0 to 7	4.3	4.7	4.6	0.13	0.140	0.144
d 7 to 14	6.2	6.4	6.5	0.18	0.367	0.793
d 14 to wean	6.8	7.2	7.4	0.20	0.020	0.264
Farrow to wean	5.6	5.9	6.0	0.13	0.093	0.285
Farrowing duration, min	399	376	350	1.08	0.226	0.873
Pigs weaned/sow, n	12.9	13.7	13.1	1.05	0.961	0.337
Piglet survivability[5], %	96.0	97.0	97.0	1.28	0.387	0.714
Overall litter gain, kg	46.3	50.3	48.2	1.55	0.543	0.047

[1]A total of 109 sows and their litters were used in a 21 d study.
[2]Ronozyme HiPhos 2700; DSM Nutritional Products, Inc., Parsippany, NJ
[3]ADFI = average daily feed intake.
[4]Sows were loaded into the farrowing room at d 107 of gestation.
[5]Piglet survivability = litter count at weaning/litter count on d 2.

Batson et al 2021 Effect of high-phytase supplementation in lactation diets on sow and litter Trans Anim Sci

DIETARY ENERGY AND ENZYMES IN SOWS
母猪的日粮能量和酶

Table 5. Effects of energy density and intervention with a multicarbohydrase containing α-galactosidase enzyme on litter uniformity using standardized litter size as a covariate to improve the fit of the model [a]

	T1	T2	T3	T4	Pooled SEM	*P*
Added Fat, %	0	1.5	3.0	0		
Enzyme [b], g/tonne	0	0	0	250		
Avg piglet weight, kg	5.38[b]	5.54[ab]	5.72[a]	5.71[a]	0.095	0.037
Litter uniformity [c], %	21.06	19.78	20.65	19.78	0.91	0.664
Light pigs [d], %						
<3.2 kg	5.26	3.12	3.80	3.81	0.90	0.390
<4.1 kg	16.54[x]	11.95[xy]	11.81[y]	11.20[y]	1.73	0.097

[a] A total of 208 sows (DNA) and their litters were used in a ~20 day study.
[b] A multicarbohydrase containing α-galactosidase, recovered in each batch of feed corresponding to T4 as ~100%.
[c] Litter uniformity is expressed as the coefficient of variation (%) of individual piglet weights within the same litter.
[d] Proportion of light weighed piglets (individual weight < 3.2 or < 4.1 kg) within each litter.

Sara Llamas-Moya et al. 2022. Effect of a multicarbohydrase containing α-galactosidase in sow lactating diets with varying energy density, Translational Animal Science, Vol 6, Issue 4, October 2022

BIO-SECURITY MITIGANTS FOR FEED
饲料生物安全缓解剂

- Formaldehyde-based甲醛基
- Organic acids有机酸
- Medium-chain fatty acids中链脂肪酸
  - E.g. Mono-laurate 例如月桂酸单酯
- Benzoic acid苯甲酸
- Don’t forget about time and temperature 不要忘记时间和温度
- Assess the disease risks carefully
- 仔细评估该疾病的风险

Shurson GC, Urriola PE, Schroeder DC. Biosecurity and Mitigation Strategies to Control Swine Viruses in Feed Ingredients and Complete Feeds. Animals. 2023; 13(14):2375. https://doi.org/10.3390/ani13142375

EFFECTS OF FEED MITIGANT CANDIDATES ON PIGS EXPOSED TO VIRAL DISEASE THROUGH FEED
候选饲料缓解剂对通过饲料暴露于病毒性疾病的猪的影响

TABLE 4A Summary of clinical scores, post-mortem diagnostics and pig performance from Experiment 3

	Clinical scores			Post-mortem diagnostics Post-mortem diagnostics			Performance	
	Diarrhoea	Lameness	Dyspnoea	Rectal swab	Serum	Tonsil	ADG (kg)	Mortality
Daafit®S 0.5%	17%[a]	0%[a]	0%[a]	8/30[ab]	0/6[a]	0/30[a]	0.35[a]	0%
Daafit®S 0.3%	17%[a]	17%[a]	0%[a]	12/30[b]	0/6[a]	10/30[b]	0.35[a]	0%
Dominnate	33%[a]	0%[a]	0%[a]	7/30[ab]	0/6[a]	0/30[a]	0.32[a]	0%
SalCURB®K2	17%[a]	17%[a]	0%[a]	8/30[ab]	0/6[a]	6/30[b]	0.35[a]	0%
Finio®	50%[ab]	17%[a]	0%[a]	3/30[a]	0/6[a]	9/30[b]	0.32[a]	0%
(+) control	100%[b]	100%[b]	100%[b]	23/30[c]	6/6[b]	6/30[b]	0.20[b]	5%
p-value	.02	.004	<.0001	<.0001	<.0001	.0006	<.0001	NA

ORIGINAL ARTICLE

Transboundary and Emerging Diseases WILEY

An evaluation of additives for mitigating the risk of virus-contaminated feed using an ice-block challenge model

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THERE ARE TWO TIMES IN PIG FEEDING WHERE IT IS A BAD TIME TO TRY TO SAVE MONEY!
在养猪时两个阶段为了省钱是一个不好的时机！
POSTWEANING AND LACTATION
断奶后和哺乳期

- Cost management considerations 成本管理注意事项
  - Duplication of effects – don't overdo it.
  - 重复的效果，不要过度做它。
  - Interactions – positive and negative 积极和消极
  - Manage shelf-life and storage issues
  - 管理保质期和存储问题
- Consider health and productivity of the sow
- 考虑一下母猪的健康和生产力
- Focus on efficacy evaluations!!
- 专注于疗效评估！！