

SCD Probiotics®

Case Study Summary – Effects of SCD Bio Livestock® on Growth Performance of Piglets

Livestock – Animal performance (CSS-019-2014)

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Industry: Livestock
Application: Weaned piglets
Where: Lithuania
When: April 2014 – May 2014
Products: SCD Bio Livestock®
SCD Customer: PATC - Advanced Environmental Technologies Center

Background

The effects of SCD Bio Livestock and Jerusalem artichoke (*Helianthus tuberosus*) on the growth performance of weaned piglets were evaluated in this trial. Thirty-four weaned piglets were fed with only basal diet, basal diet with probiotics, and basal diet with probiotics and Jerusalem artichokes. From the treatments, it was observed that the SCD Bio Livestock is effective on growth performance of piglets compared with control group and probiotics plus Jerusalem artichoke-treated group.

Introduction

Young piglets are subjected to several stressors such as nutritional, environmental, social and microbial imbalance during the weaning period. The use of growth promoting antibiotics in pig diets was banned in the EU in 2006 because there is an increasing evidence of microorganisms becoming resistant to antibiotics in both animals and humans due to these growth promoters. Thus, the development of alternatives to antibiotic growth promoters is urgently needed in commercial pig production. Prebiotics (*i.e.* Jerusalem artichoke) and probiotics, in combination (synbiotics) or alone, may be the potential alternatives for antibiotic growth promoters (Shim, 2005).

Probiotics are live microbial feed supplements that beneficially affect the host animal by improving its microbial balance. Probiotics have been reported to increase feed intake, growth, immune responses, the numbers of *lactobacilli* and decrease the numbers of *E. coli* (Shim, 2005; Rolfe, 2000; Lessard and Brisson, 1987) Most probiotic studies that were reported on in literature used single or two strains probiotics rather than multi-strain and consortia bacteria but Rolfe (2000) suggested that multiple probiotic strains may be more useful than a single strain because they can proliferate more lactic acid bacteria than single strain of probiotics.

SCD Probiotics® Technology has the products with selected microorganism strains that are grown in “consortia”, in a process of co-growth that combines multiple strains during production. Through the consortia culturing processes Pat. US 9,096,836 B2, the



microorganisms become a small eco system - much more resilient and capable of working together synergistically. SCD Bio Livestock is an all-natural, probiotic-based feed and water additive containing a powerful blend of beneficial microorganisms.

Jerusalem artichoke (*Helianthus tuberosus*), also called sunroot or earth apple, is a plant that has the potential to be used as a prebiotics component with the content of tuber fructooligosaccharides (FOS), sugars that naturally occur in some plants. In a commercial pig farm study (Jelgava, Latvia), it was suggested that feeding with probiotics and Jerusalem artichoke significantly improves the microbial contents, defense, and regeneration process in the intestine of pigs (Valdovska et al, 2014).

The objective of this trial was to determine the impact of the supplementation of probiotics alone and combined with Jerusalem artichoke on the growth performance of weaned pigs.

Methodology

Thirty-four piglets were used for a 49 day (7 week) trial. The piglets were divided into three groups such as Control, SCD, and SCD + JA. Control group was fed with basal diet; SCD group was fed with basal diet and probiotics; and SCD + JA group was fed with basal diet supplemented with probiotics and Jerusalem artichoke.

Table I: Number, gender and weight of 14 days old piglets for a-Control, b-SCD and c-SCD+JA trial groups

	Control		SCD		SCD + JA	
	Weight (kg)	Gender	Weight (kg)	Gender	Weight (kg)	Gender
1	4.9	male	4.6	female	3.3	female
2	4.3	female	4.5	male	4.1	female
3	4.0	male	4.1	male	4.3	male
4	4.4	male	4.5	female	4.1	female
5	5.0	male	5.1	female	4.2	male
6	4.6	male	4.9	female	4.4	female
7	4.6	male	4.2	Male	3.9	male
8	4.9	male	5.5	female	4.4	female
9	4.7	female	5.5	Male	3.3	male
10	3.4	male	4.4	female	4.4	male
11	4.7	female	4.1	Male	3.8	female
12	-	-	-	-	3.7	male
TOTAL	49.5		51.4		47.9	

The numbers of mixed gender piglets for three groups were 11 for Control group; 11 for SCD group; and 12 for SCD + JA group with total initial weight of 49.5 kg, 51.4 kg, and 47.9 kg respectively (Table I).



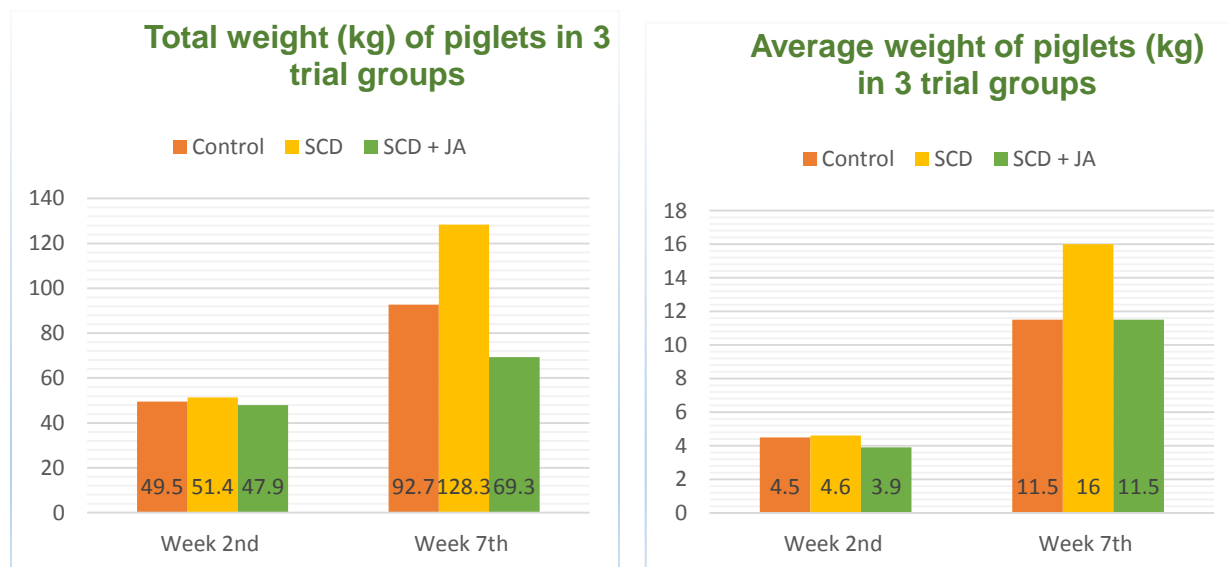
SCD Bio Livestock (containing $>3.0 \times 10^5$ cfu/ml Lactic Acid Bacteria and $<1.0 \times 10^6$ cfu/ml Yeast) was sprayed to the feed at 2 ml for 2nd and 3rd weeks; 3 ml for 4th week; 4 ml for 5th week, 5 ml for 6th week and 6 ml for 7th week dose per piglet per day as a feed additive. Jerusalem artichoke powder was made from cultivated plants and containing 45% insulin and mixed at a 3% ration of basal feed. Basal diet was formulated the NRC-recommended (1998) feeding standards.

Weight gains and growth performances of piglets were measured and recorded weekly for all groups from 14 to 49 days of age. During the 5th week, total weight of piglets in each group, average piglet weights, the average increase in kg of piglets per week and the average growth of piglets per day were also measured.

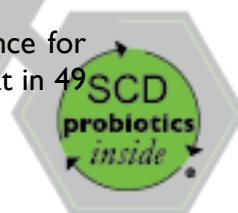
Results

The initial total weights of groups on day 14th were 49.5 kg for group A; 51.4 kg for group B and 47.9 for group C with the average weights per piglet as 4.5 kg, 4.6 kg and 3.9 kg respectively. At the end of the trial (49th day), the total weight of the A, B, and C groups were 92.7 kg, 128.3 kg and 69.3 kg with an average weight of 11.5 kg, 16.0 kg and 11.5 kg respectively (Chart I).

Chart I: Total weight and average weight of piglets for three trial groups on 2nd and 7th weeks



The average increase in kg of piglets per week for trial groups showed a great difference for SCD group when it was compared with Control and also with SCD + JA. It was seen that in 49 days, the piglets in SCD group gained highest weight in kg daily.



It was observed that for 3rd and 5th weeks, the daily average weight gain was higher for SCD + JA than Control group although the SCD + JA group's initial total weight was less than both Control and SCD groups (Table II).

Table II: The data of average weight, average growth per day and average growth per week of the piglets for three trial groups between 2nd and 7th weeks Page | 4

Week 2, 3 and 4	APW* (kg)		AGPW** (kg)	AGPD*** (kg)	APW (kg)	AGPW (kg)	AGPD (kg)
	14 days (2 weeks)	21 days (3 weeks)		28 days (4 weeks)			
Control¹	4.50	6.06	1.56	0.22	7.59	1.52	0.21
SCD²	4.67	6.92	2.25	0.32	9.00	2.07	0.29
SCD + JA³	3.99	5.82	1.83	0.26	7.83	2.00	0.28

Week 5, 6 and 7	APW (kg)	AGPW (kg)	AGPD (kg)	APW (kg)	AGPW (kg)	AGPD (kg)	APW (kg)	AGPW (kg)	AGPD (kg)
	35 days (5 weeks)			42 days (6 weeks)			49 days (7 weeks)		
Control	8.02	0.42	0.06	9.56	1.54	0.22	11.58	3.56	0.50
SCD	9.48	0.48	0.06	11.72	2.22	0.32	16.03	4.31	0.61
SCD + JA	7.88	0.05	0.007	8.35	0.47	0.06	11.51	3.16	0.45

¹ A - Control: piglets were fed with basal diet

² B - SCD: piglets were fed with probiotics

³ C - SCD+JA: piglets were fed with probiotics and JA

* APW: Average piglet weight

** AGPW: Average growth per week

*** AGPD: Average growth per day



It was observed that the average piglet weight of SCD group increased from 4.6 kg to 16.03 kg with an 11.36 kg difference, while the differences were 7.08 kg for Control and 7.58 kg for SCD+JA groups (Chart 2).

Chart 2: The difference between initial weights (week 2nd) and final weights (week 7th) of the Control, SCD and SCD + JA groups



Conclusions

In conclusion, the present trial indicated that the piglets supplemented with probiotics (SCD Bio Livestock) in an early stage of their life affects the weight gain positively. The additive of Jerusalem artichoke along with probiotics did not have a positive effect on daily or weekly weight gain after 4 weeks however since the SCD + JA group has started the trial with the lowest group weight, the weight gain average at the end of 7th week was higher than control group.

The use of Jerusalem artichoke along with probiotics should be evaluated again on piglets but under the same circumstances for the further studies to detect the effect of probiotics & prebiotics combination.

The findings suggest that SCD Bio Livestock can be used as feed additive for piglets to increase the weight gain.



References

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