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#### **SCD Probiotics<sup>®</sup>**



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

Livestock – Animal peformance (CSS-019-14)

Industry:	Livestock
Application:	Weaned piglets
Products:	SCD Bio Livestock <sup>®</sup>

Page | 1

inside

#### Highlight

• SCD Bio Livestock is effective on the growth performance of piglets, compared with the control group and the probiotics plus Jerusalem artichoke-treated group

#### Introduction

Young piglets are subjected to several environmental, social, and nutritional stressors, including microbial imbalance, during the weaning period. The use of growth-promoting antibiotics in pig diets was banned because there is increasing evidence of microorganisms becoming resistant to antibiotics in both animals and humans due to these growth promoters. As antibiotic resistance concerns develop worldwide, 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 potential alternatives for antibiotic growth promoters (Shim, 2005).

Probiotics are live microbial supplements that beneficially affect the host animal by improving its microbial balance. Probiotics have been reported to increase feed intake, growth, and immune responses, as well as to increase 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 in literature used single or two strain probiotics rather than multi-strain and consortia bacteria, but Rolfe (2000) suggested that multiple probiotic strains might be more useful than a single strain because they can proliferate more lactic acid bacteria than single strain probiotics.

SCD Probiotics<sup>®</sup> crafts products with selected microorganism strains that are grown in "consortia", a process of co-growth that combines multiple strains during production. Through the consortia culturing processes (Pat. US 9,096,836 B2), the microorganisms form a small ecosystem and as a result, become 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 prebiotic component due to its tuber fructooligosaccharides (FOS) content, which are sugars that naturally occur in some plants. In a commercial pig farm study, itscp was suggested that feeding with probiotics and Jerusalem artichoke significantly improves the objection SCD Probiotics specializes in manufacturing all-natural probiotic products for human-health and environmental sustainability



microbial contents, defense, and regeneration process in the intestine of pigs (Valdovska et al, <sup>tics</sup> 2014).

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

Page | 2

inside

### Methodology

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

**Table I**: Number, Gender and Weight of 14-day Old Piglets for a-Control, b-SCD and c-SCD+JA Trial Groups

	Control		SC	D	SCD + JA		
	Weight (kg)	Gender	Weight (kg)	Gender	Weight (kg)	Gender	
	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 number of mixed gender piglets for the three groups was 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 1).

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 2<sup>nd</sup> and 3<sup>rd</sup> weeks; 3 ml for 4<sup>th</sup> week; 4 ml for 5<sup>th</sup> week, 5 ml for 6<sup>th</sup> week, and 6 ml for 7<sup>th</sup> week, all per piglet per day as a feed additive. The Jerusalem artichoke powder was made from cultivated plants, contained 45% insulin, and was mixed at a 3% ration of basal feed. The basal diet was formulated per the NRC-recommended (1998) feeding standards.

Weight gains and growth performances of piglets were measured and recorded weekly for all scop groups from 14 to 49 days of age. During the 5<sup>th</sup> week, total weight of piglets in each groupSCD Probiotics specializes in manufacturing all-natural probiotic products for human-health and environmental sustainability



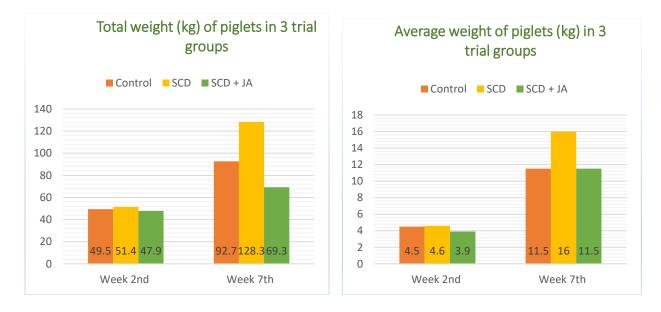
average piglet weights, the average increase in kg of piglets per week and the average growth of tics piglets per day were also measured.

#### Results

Page | 3

The initial total weights of the groups on day 14 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 (49<sup>th</sup> 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 1).

**Chart I:** Total Weight and Average Weight of Piglets for Three Trial Groups on Weeks 2 and 7



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

It was observed that for  $3^{rd}$  and  $5^{th}$  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).



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**Table II**: Piglets' Average Weight, Average Growth Per Day and Average Growth Per Weekfor the Three Trial Groups Between Weeks 2 and 7

	APW* (kg)		AGPW** (kg)	AGPD*** (kg)	APW (kg)	AGPW (kg)	AGPD (kg)	Page   4
Week 2, 3 and 4	14 days (2 weeks)		21 days (3 weeks	28 d (4 we				
Control	4.50	6.06	1.56	0.22	7.59	1.52	0.21	
SCD <sup>2</sup>	4.67	6.92	2.25	0.32	9.00	2.07	0.29	
SCD + JA <sup>3</sup>	3.99	5.82	1.83	0.26	7.83	2.00	0.28	

Week	APW (kg)	AGPW (kg)	AGPD (kg)	APW (kg)	AGPW (kg)	AGPD (kg)	APW (kg)	AGPW (kg)	AGPD (kg)
5, 6 and 7	5, 6 and 7 35 days (5 weeks)			42 days			49 days		
				(6 weeks)			(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

<sup>1</sup> A - Control: piglets were fed with basal diet

<sup>2</sup> B - SCD: piglets were fed with probiotics

 $^{3}$  C - SCD+|A: piglets were fed with probiotics and |A

\* APW: Average piglet weight

\*\* AGPW: Average growth per week

\*\*\* AGPD: Average growth per day

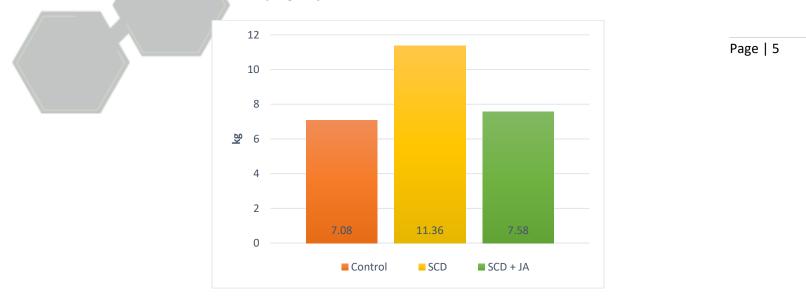
It was observed that the SCD group's average piglet weight increased from 4.6 kg to 16.03 kg, with an 11.36 kg difference, while the differences were 7.08 kg for Control and 7.58 kg for SCD+JA groups (Chart 2).



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**Chart 2:** The Difference Between Initial Weights (week 2) and Final Weights (week 7) of the Control, SCD and SCD + JA groups



### Conclusions

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

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

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



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Page | 6

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