

Industrial by-products as alternative to cereals do not impair piglets gut microbiota

Tretola M.^{1,2}, Luciano A.¹, Ottoboni M.¹, Comi M.³, Manoni M.¹, Fumagalli F.¹, Rovere N.¹, Pinotti L.¹

¹Department of Health, Animal Science and Food Safety "Carlo Cantoni", University of Milan, Italy

²Agroscope, Institute for Livestock Sciences, Posieux, 1725, Switzerland

³Università Telematica San Raffaele Roma, Italy

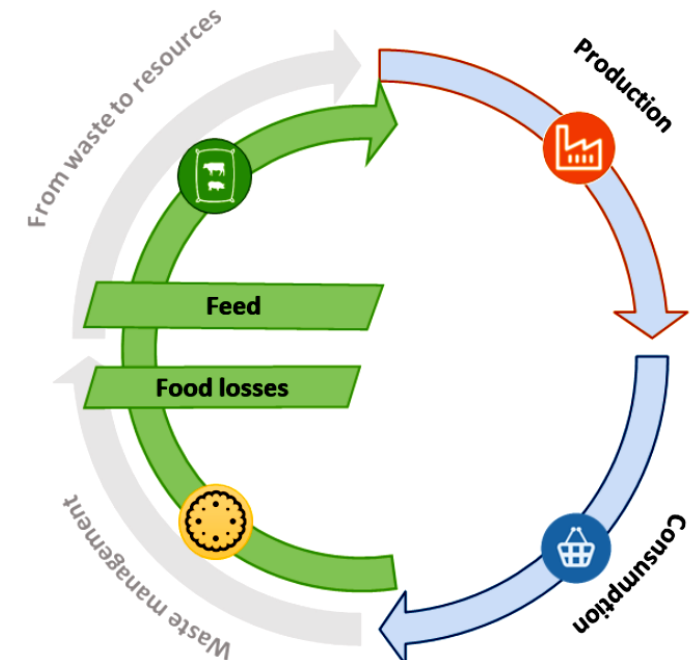


Introduction

From a linear...



...to a circular economy



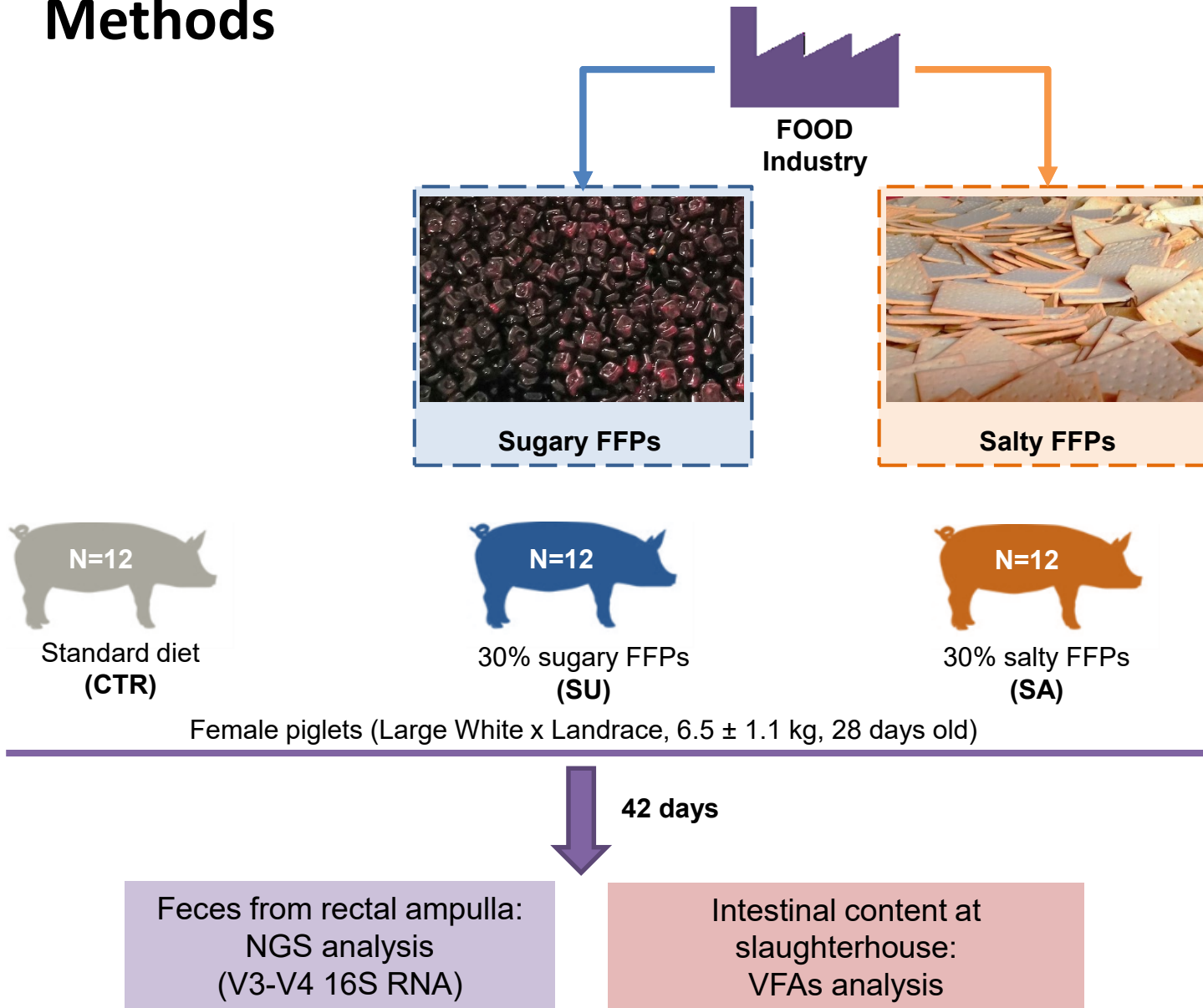
Aim

Effects of a partial replacement of cereals by food industry leftovers (FFPs) in post-weaning piglets diets on:

- 1- gut microbiota composition
- 2- intestinal volatile fatty acids (VFAs) production



Methods



Ingredients	Experimental diets (g/100g)		
	CTR	SU	SA
Wheat	25	25	17
Sugary FFPs	-	30	-
Salty FFPs	-	-	30
Wheat flaked/hulled	10	-	-
Barley flaked/hulled	10	-	-
Barley	14.1	6.1	10
Sweet whey	8	8	8
Whole soybeans flaked/ground	6	1	4
Bran	5	14	11
Fermented soy protein concentrate	5	3	5
Rice flakes	5	-	5
Vitamin pre-mix	2.6	2.6	2.2
Fish Meal	2	2	2
Soybean Meal 47%	1.4	4.9	-
Soybean Oil	1.3	-	1.1
Sucrose	1	-	1
...			



Results

Gut microbiota composition

Table 1.

	Experimental diets ¹			SEM	P-values
	CTR	SU	SA		
Observed	420.6	400.4	398.5	15.29	0.811
Chao1	426.5	406.5	402.1	15.49	0.793
Gini Simpson	0.981	0.983	0.981	0.001	0.707
Shannon	4.914	4.962	4.910	0.062	0.933

Figure 1.

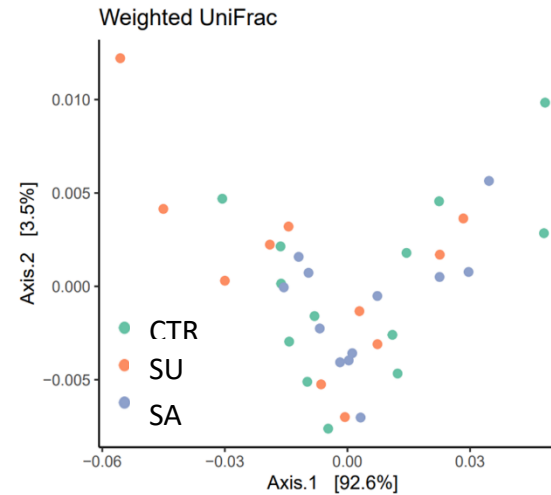
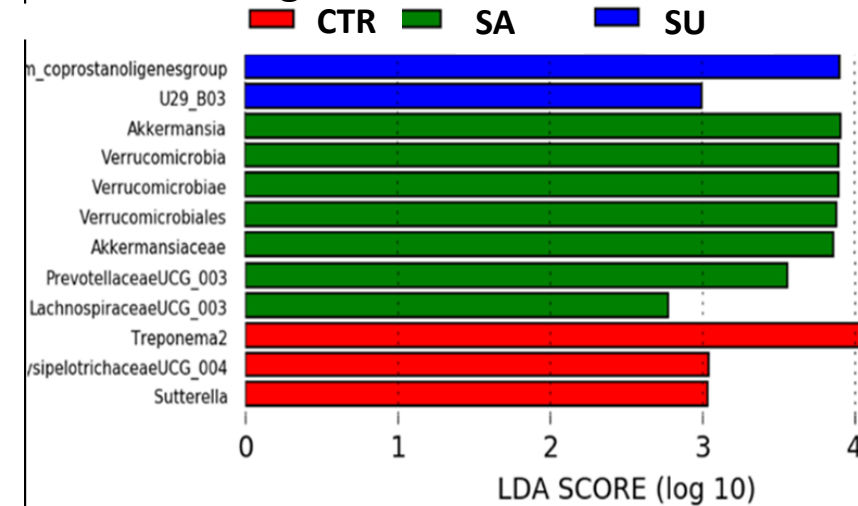


Figure 2.



Intestinal VFAs production

Table 2.

	Experimental diets			SEM	P - values
	CTR	SU	SA		
Acetate	45.1	42.9	46.7	1.69	0.67
Propionate	8.01	7.64	9.01	0.51	0.55
Butyrate	10.9	10.4	11.8	0.87	0.81
Valerate	0.67	0.72	0.73	0.06	0.92

Conclusion

- Limited effects of SU and SA FFPs on gut microbiota composition and VFAs production
- Safe alternatives to cereals grains in post-weaning and growing periods
- Effects on gut health to be tested for a longer period.

