

# Interaction between a potentiated formulation of ZnO and a mixture of tannins to reduce post-weaning-diarrhea in an ETEC infection model

C. Ollagnier<sup>1</sup>, M.R. Mellino<sup>2</sup>, N. Pradervand<sup>1</sup>, S. Dubois<sup>1</sup>, A. Romeo<sup>3</sup>, O. Desrues<sup>4</sup>, G. Bee<sup>1</sup>

<sup>1</sup> Agroscope, Posieux, Switzerland; <sup>2</sup> University of Sassari, Sassari, Italy; <sup>3</sup> Animine, Annecy, France; <sup>4</sup> Silvateam, San Michele Mondovì, Italy

www.agroscope.ch

## INTRODUCTION

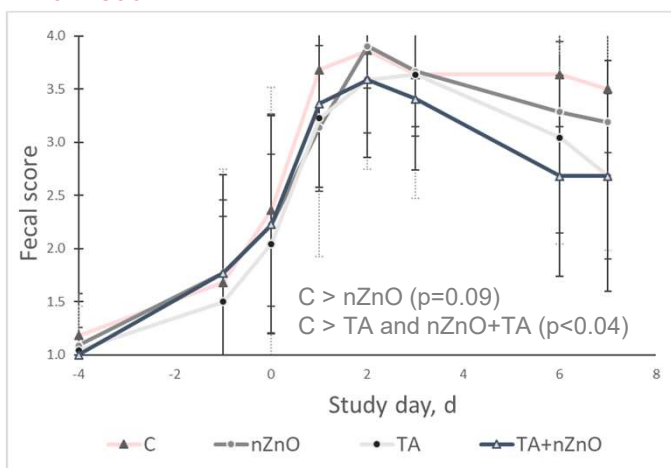
With the emergence of multi-resistant bacteria, there is an urgent need to find alternatives to antimicrobials to prevent or treat post-weaning diarrhoea in piglets. The objective of this study was to evaluate the interactions between a potentiated zinc oxide formulation and a tannin mixture on piglets performances in a model of enterotoxigenic Escherichia coli F4 (ETEC F4) infection.

## CONCLUSION

- Chestnut and Quebracho tannins reduced the severity of diarrhoea and increased feed intake, without improving the ADG.
- The addition of a potentiated form of ZnO and tannins has reduced the number of antibiotic treatments, but there is no clear evidence of synergy between the two treatments.

## RESULTS

### FECAL SCORE



### ZOOTECNICAL PERFORMANCES

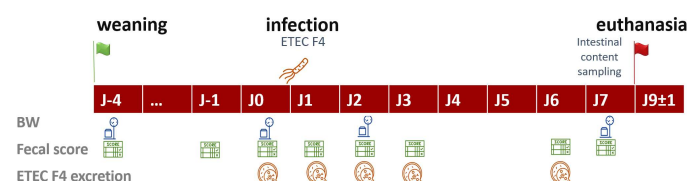
Parameters	C	nZnO	TA	TA+nZnO	standard deviation	P
Average number of days in diarrhea, d	5.54	4.91	4.91	4.77	1.6	0.25
Average consumption, kg/d/piglet	0.07 <sup>a</sup>	0.07 <sup>a</sup>	0.10 <sup>b</sup>	0.09 <sup>ab</sup>	0.007	0.04
before infection	0.05	0.06	0.07	0.05	0.050	0.53
after infection	0.08 <sup>a</sup>	0.08 <sup>a</sup>	0.12 <sup>b</sup>	0.12 <sup>b</sup>	0.008	0.01
Percentage of piglets treated with antibiotics	18% <sup>a</sup>	4% <sup>b</sup>	0% <sup>b</sup>	0% <sup>b</sup>	-	0.05
Average daily gain, kg/d	-0.037	-0.029	0.009	-0.001	0.0904	0.22

## MATERIALS AND METHODS

### ANIMALS:

- 88 Swiss Large white piglets (22 piglets/group)
- Age at weaning: 27 ± 1 d
- Bodyweight: 7.3 ± 1.0 kg
- All feeds had the same composition and were formulated to cover the needs of weaned piglets according to Swiss recommendations (Agroscope, 2021).
- Feeding *ad libitum*, leftovers weighted daily per pen.
- Watery diarrhea for 5 days = antibiotic treatment (AW reason)

### STUDY DESIGN:



### DIET AND TREATMENTS:

- C:** Negative control. Standard feed.
- nZnO:** Feed containing 150 mg/kg Zn from a potentiated ZnO source, (HiZox®, Animine, France)
- TA:** Feed containing 0.75% tannin-rich extract (NutriP®, Silvateam, Italy) of chestnut and Quebracho
- TA+nZnO:** Feed containing a tannins extract and a source of potentiated ZnO at 150 mg/kg Zn

## STUDY PARAMETERS AND STATISTICS

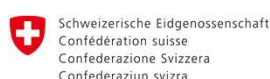
**Fecal score**

- Diarrhea = fecal score ≥ 3.
- Analysis of the number of days of diarrhea, Average Daily Gain (ADG) and consumption by ANOVA.
- Analysis of faecal scores by ordinal regression.

Agroscope une bonne alimentation, un environnement sain



A financial contribution was received from Animine and Silvateam to cover part of the costs of the laboratory analyses.



Département fédéral de l'économie, de la formation et de la recherche DEFR  
Agroscope