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Agroscope

# Reduced antibiotic use in piglets: effects of tannins and salicylate as alternatives in susceptible piglets artificially infected with *E. coli* F4 ac

Agroscope

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# 🇨🇭 Post-weaning diarrhoea and antibiotics

- Post-weaning diarrhoea (PWD): major enteric disease occurring mainly during the first week after weaning
- Aetiology: Multifactorial but often related to pathogen infection, especially Enterotoxigenic *Escherichia coli* (ETEC) → In 2016 in Switzerland, ETEC was detected in 42.5% of weaned pigs suffering from diarrhoea (Schubnell et al., 2016).
- In Switzerland, 53.3% of *E. coli* isolated from pig farms are resistant to one or more antimicrobials (Arch-vet report, 2016)



Tannins and salicylate as alternative to antibiotics in susceptible piglets artificially infected with *E. coli* F4 ac

Introduction



# Proposed solutions as alternatives

- Sows vaccination against *E.coli* F4 (cf. poster Andreas Gutzwiller)
- Breeding *E.coli* F4 resistant piglets (cf. poster Dou Hu)
- Bioactive compounds as feed additives :
  - Salicylate has been proposed to decrease the severity of diarrhea (anti-secretory properties)
  - Hydrolysable tannins are known to have antimicrobial properties

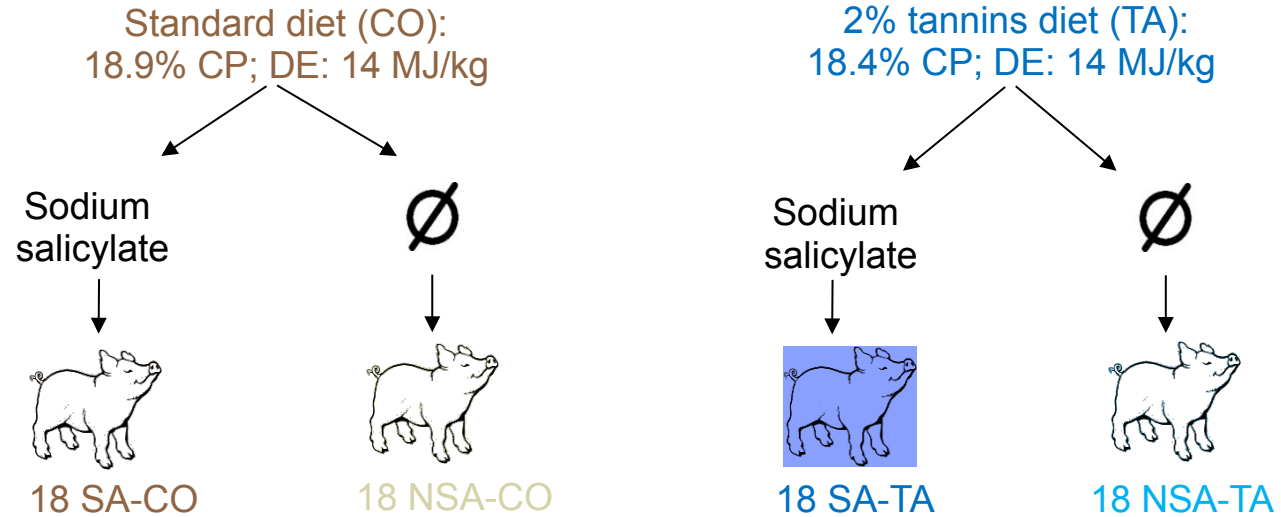
## Goal :

Studying whether a standard diet supplemented with **hydrolysable tannins** combined or not with **sodium salicylate** could reduce the prevalence of PWD in susceptible piglets

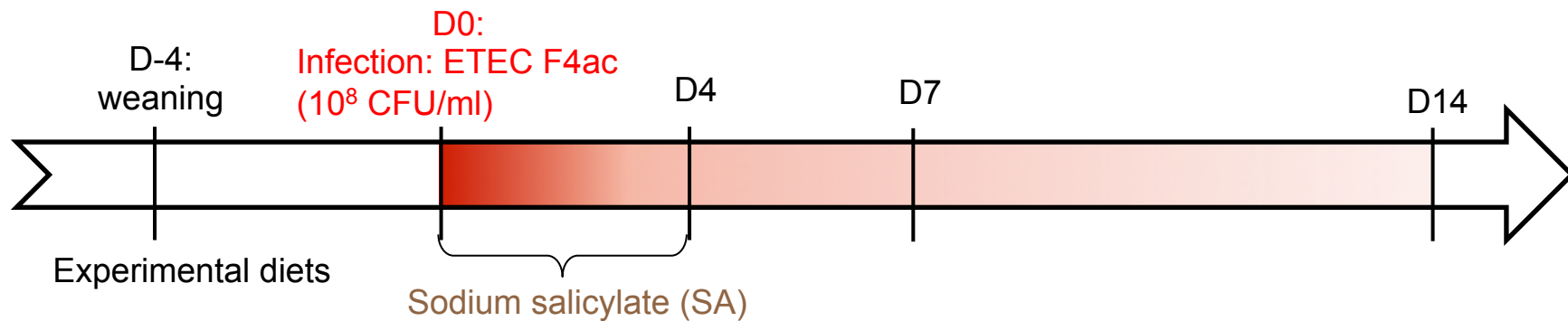


# Experimental design

## Composition of the groups:



## Organisation of the trial:



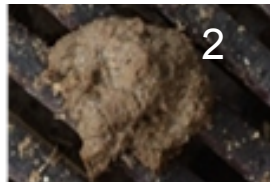


# Measurements

- Growth performances: feed intake per pen, average daily gain for 2 weeks
- Consistency of the faeces (faecal score) using a scale from 1 (dry, pelleted) to 4 (watery diarrhoea) to calculate the percentage of piglets in diarrhoea and the number of days in diarrhoea



normal



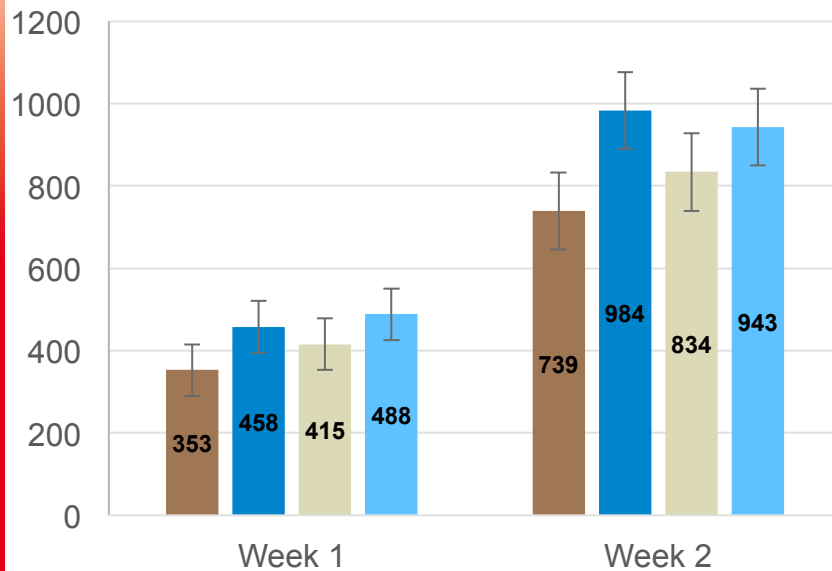
diarrhoea



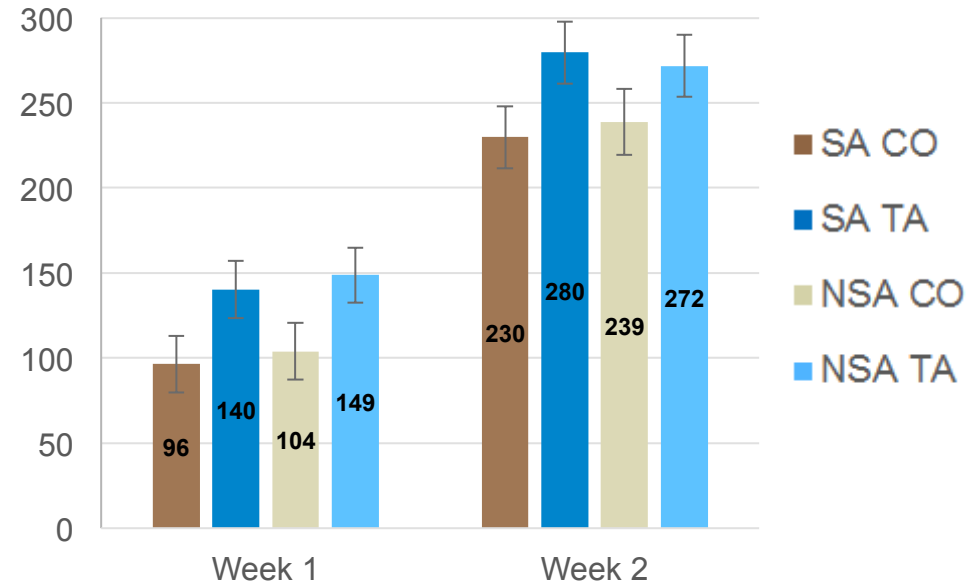


# Growth performances

Feed intake per pen (g/d) ( $\pm$  SE)



Average daily gain (g/d) ( $\pm$  SE)



P-values:

Week 1:

- Salicylate: P = 0.33
- Feed: P = 0.07
- Salicylate x Feed: P = 0.74

Week 2:

- Salicylate: P = 0.57
- Feed: P < 0.001
- Salicylate x Feed: P = 0.16

P-values:

Week 1:

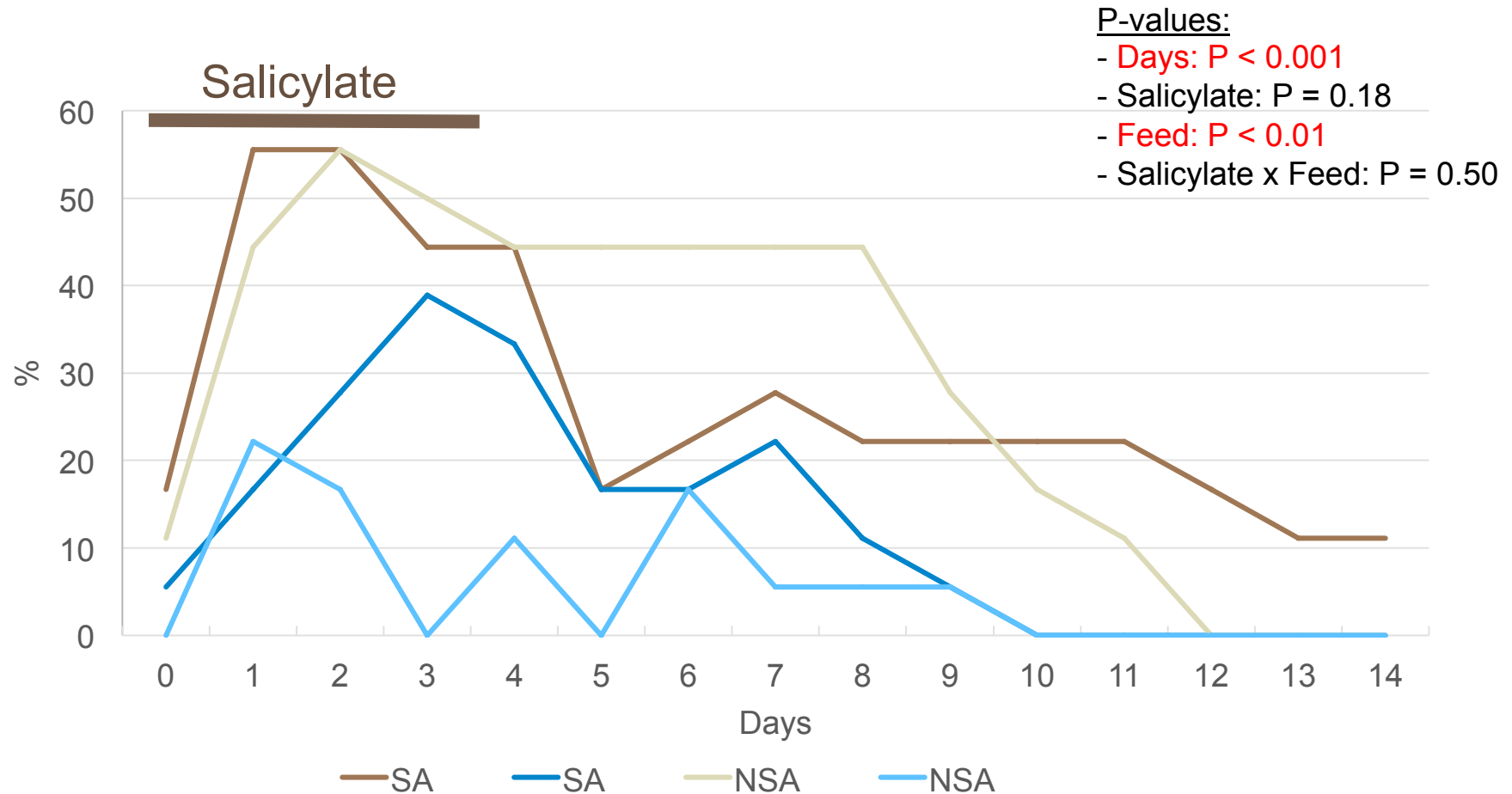
- Salicylate: P = 0.63
- Feed: P < 0.01
- Salicylate x Feed: P = 0.97

Week 2:

- Salicylate: P = 0.98
- Feed: P = 0.03
- Salicylate x Feed: P = 0.65

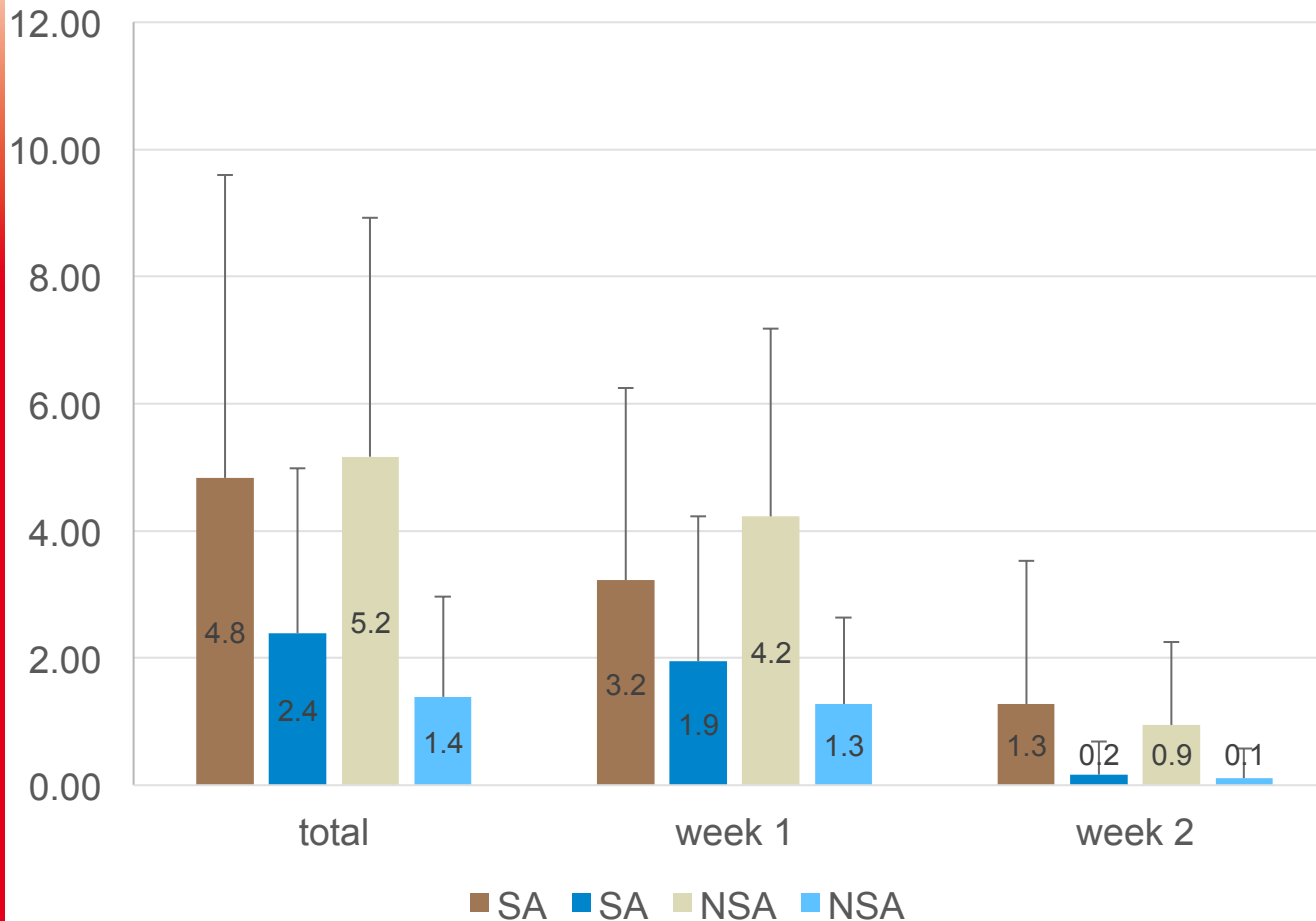


# Percentage of piglets with diarrhoea





# Days in diarrhoea ( $\pm$ SD)



## P-values:

### TOTAL:

- Salicylate: P = 0.21
- **Feed: P < 0.01**
- Salicylate x Feed: P = 0.85

### WEEK 1:

- **Salicylate: P = 0.08**
- **Feed: P < 0.01**
- Salicylate x Feed: P = 0.41




### WEEK 2:

- Salicylate: P = 0.97
- **Feed: P = 0.01**
- Salicylate x Feed: P = 0.36





# Conclusions

-  No piglet was treated with antibiotics
  
-  Sodium salicylate supplementation had no effect on growth performances and did not decrease the severity of diarrhoea.
  
-  Tannins supplementation improved growth performances and decreased the severity of diarrhoea:
  - Increase in feed intake and average daily gain during the 2 weeks after infection
  - Decrease in number of piglets with diarrhoea and the duration of diarrhoea (days in diarrhoea)



# Thank you for your attention

