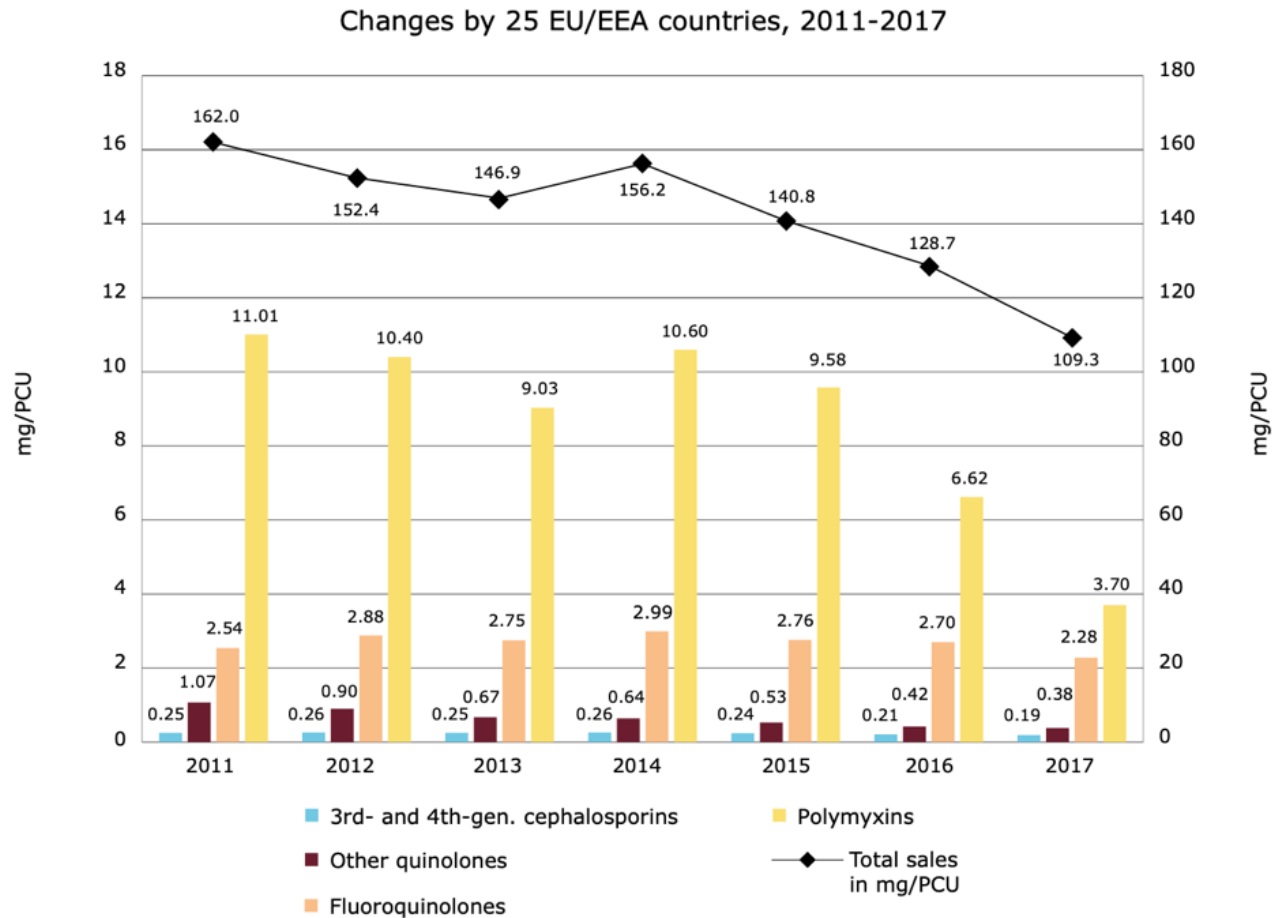


Figure 24. Changes in aggregated overall sales, as well as sales of fluoroquinolones, other quinolones, 3rd- and 4th-generation cephalosporins and polymyxins, for 25 EU/EEA countries¹, from 2011 to 2017 (note the differences in the scales of the Y axes)



¹ Austria, Belgium, Bulgaria, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

Biosicurezza

- Esterna
- Interna
 - Tutto pieno- Tutto vuoto
 - Integrità delle bande
 - Pulizia e disinfezione
 - Conduzione di acqua
 - Salmonella può rimanere al biofilm
 - Controllo di topi e rate
 - Altri animali



Pulizia e disinfezione

Pen Floors			Enterobacteriaceae ^a				Salmonella ^b			
Category	Farm	Samples Tested (n)	Before washing		After washing		Before washing		After Washing	
			Range	Median	Range	Median	Positive samples (n)	Range	Positive samples (n)	Range
3	A	64	1.7-6.6	4.5	0-5.8	0.8	- ^c	-	- ^c	-
High 2	B	64	3.5-6.1	4.6	0-1.6	0	- ^c	-	- ^c	-
High 2	C	72	0-5.1	1.2	0-1.6	0	1	1.1	- ^c	-
1	D	84	2.6-6.1	4.6	0-3.6	0.8	26	36->106	1	7.2
1	E	84	0-3.6	1.6	0-3.2	0	- ^c	-	- ^c	-
1	F	60	1.2-5.1	3.3	0.7-4.2	2.9	- ^c	-	- ^c	-
1	G	72	0-6.0	2.0	0-3.6	0	- ^c	-	1	0.36
1	H	48	0.8-4.2	3.7	0.7-4.1	2	- ^c	-	- ^c	-

Table 1. Effect of cleaning procedure on levels of *Salmonella* and *Enterobacteriaceae* on the pen floors. ^aLog₁₀ cfu/cm². ^bMPN/cm²; detection limit, 0.36 MPN/cm². ^cNegative for *Salmonella* (detection limit, <0.36 MPN/cm²).

Pulizia e disinfezione

Feeder/Drinker Units			Enterobacteriaceae ^a				Salmonella ^b			
			Before washing		After washing		Before washing		After Washing	
Category	Farm	Samples Tested (n)	Range	Median	Range	Median	Positive samples (n)	Range	Positive samples (n)	Range
3	A	16	3.0-5.6	4.4	2.4-6.8	5.2	— ^c	—	1	4600
High 2	B	16	3.7-5.7	5	0.7-6.8	5.6	— ^c	—	3	11-240
High 2	C	24	0-6	2	2.0-6.0	5	— ^c	—	— ^c	—
1	D	27	3.7-6.1	5.5	0-6.1	4.9	6	0.92-105	2	0.6-7.2
1	E	36	1.5-4.9	3.4	0-5.5	3	— ^c	—	— ^c	—
1	F	24	0.5-4.9	3.5	3.2-5	4.4	— ^c	—	— ^c	—
1	G	24	0-5..5	2.8	0-4.1	2.8	— ^c	—	— ^c	—
1	H	20	3.4-4.9	3.9	3.3-6	4	— ^c	—	— ^c	—

Table 2. Effect of cleaning procedure on levels of *Salmonella* and *Enterobacteriaceae* in feeder/drinker units
^aLog₁₀ cfu/cm². ^bMPN/cm²; detection limit, 0.36 MPN/cm². ^cNegative for *Salmonella* (detection limit, <0.36 MPN/cm²).



Acqua

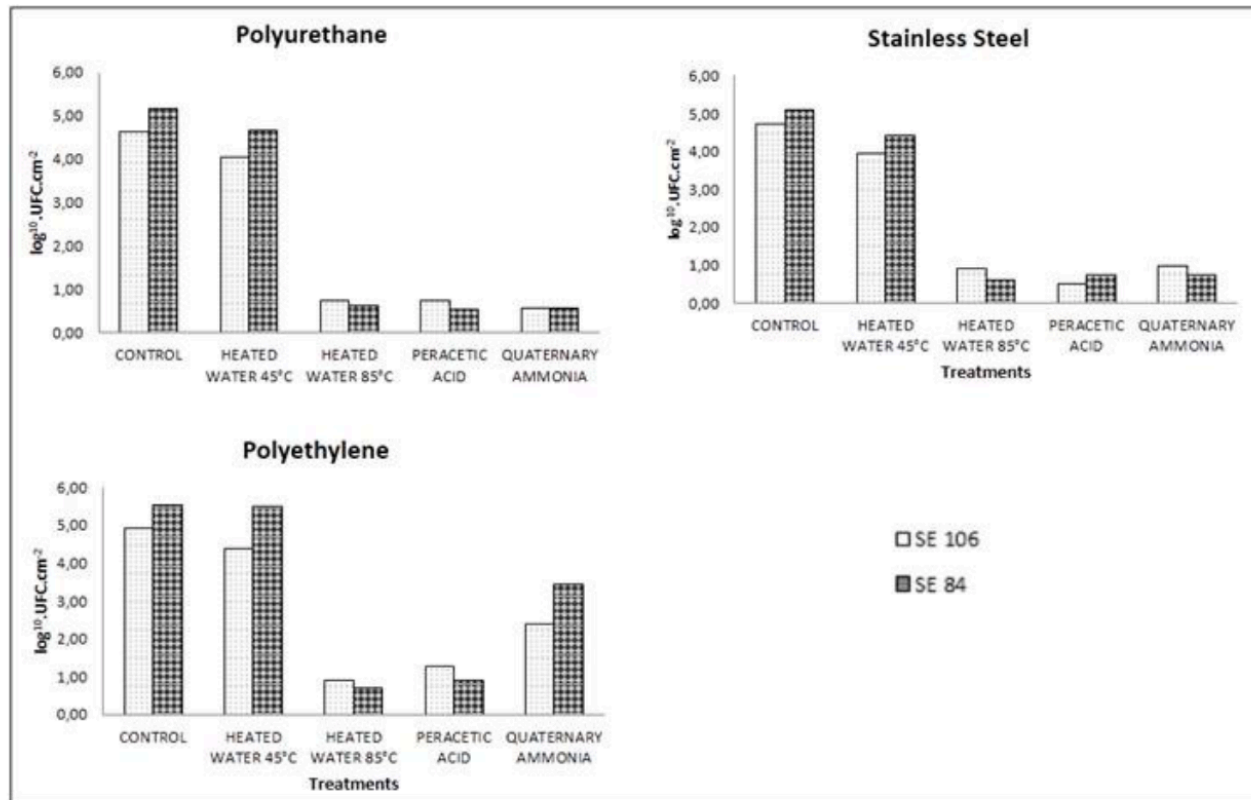


Figure 4 Removal of biofilm formed by SE of poultry origin on stainless steel, polyethylene and polyurethane surfaces by different hygiene procedures. Abbreviations: Heat water 45 °C: sterile water heated at 45 °C; Heat water 85 °C: sterile water heated at 85 °C; Peracetic acid (0.5%); Quaternary ammonia (1%).

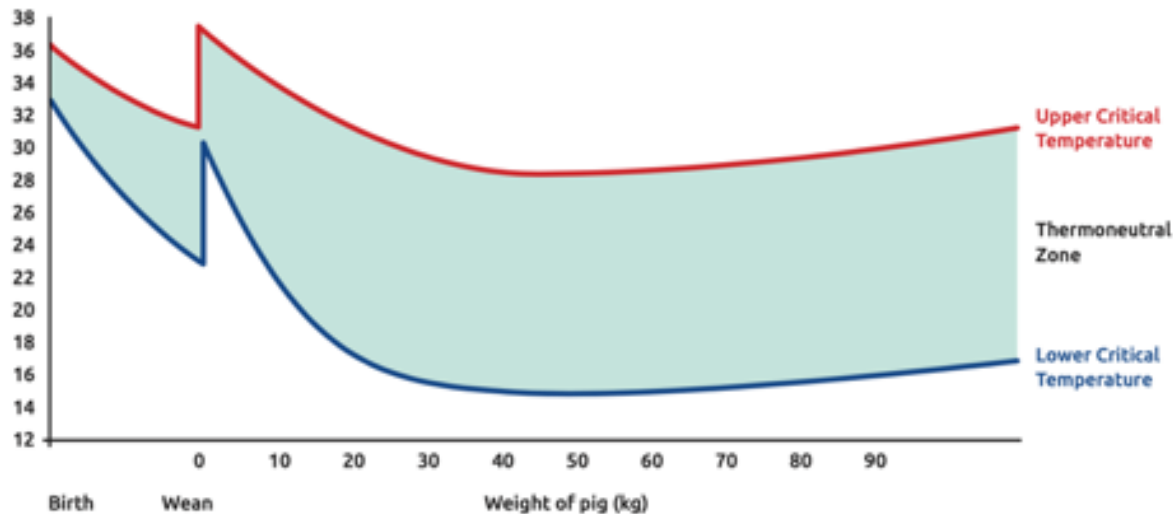
Prevenzione

- I suini portatori o l'ambiente contaminato sono le più comuni fonti di infezione.
- Ridurre al minimo la dose di esposizione e lo stress.
 - Ridurre al minimo la miscelazione
 - Tutto sommato
 - Densità corretta
 - Temperatura e ventilazione confortevoli
- Controllare altri processi infettivi
- Alimentazione
 - Farina grossolana
 - Aditivi
- Vaccinazione
- Il trattamento preventivo funziona ma sempre più difficile

Trattamento e controllo

Esigenze di temperatura:

Ideale 3°C su LCT (temperatura critica inferiore) e sempre inferiore a ECT (temperatura critica di evaporazione)

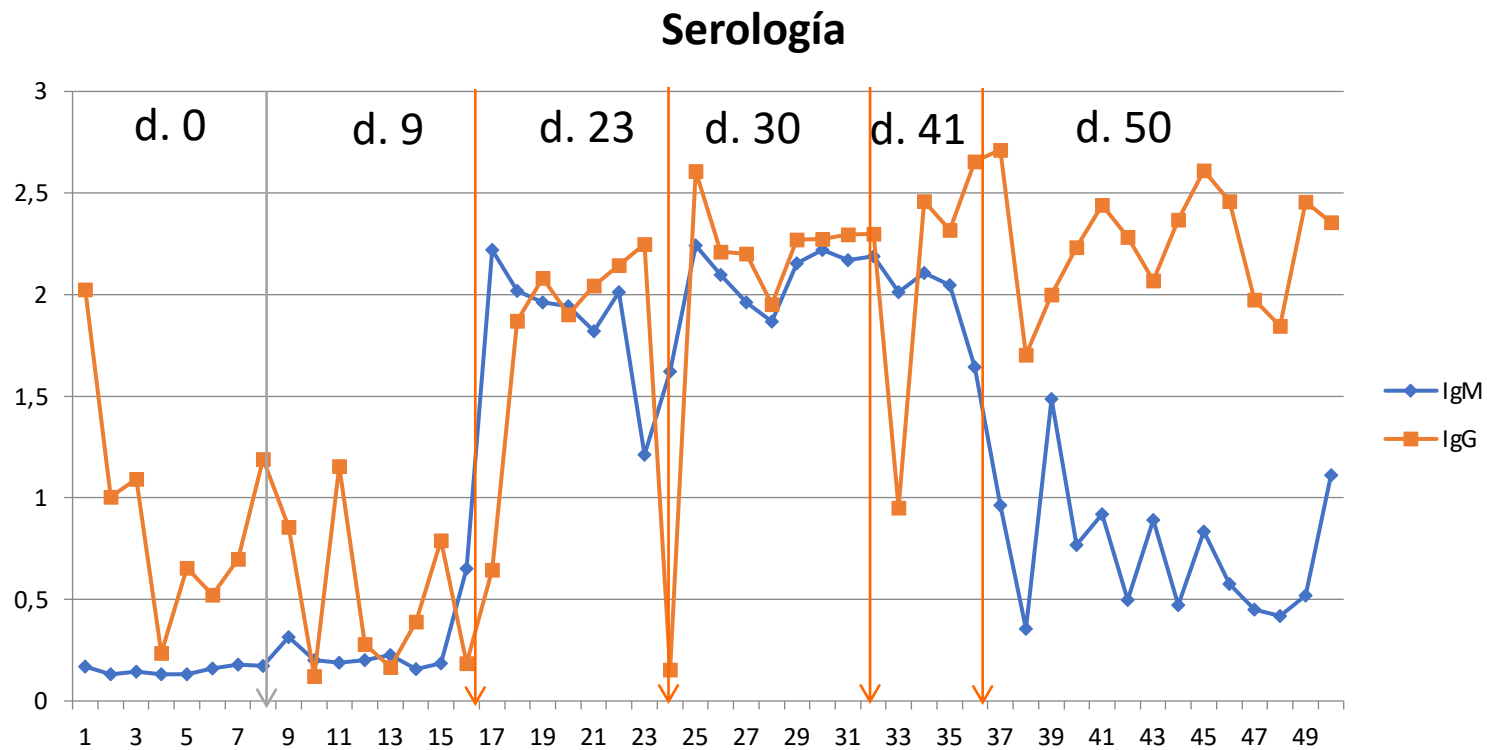




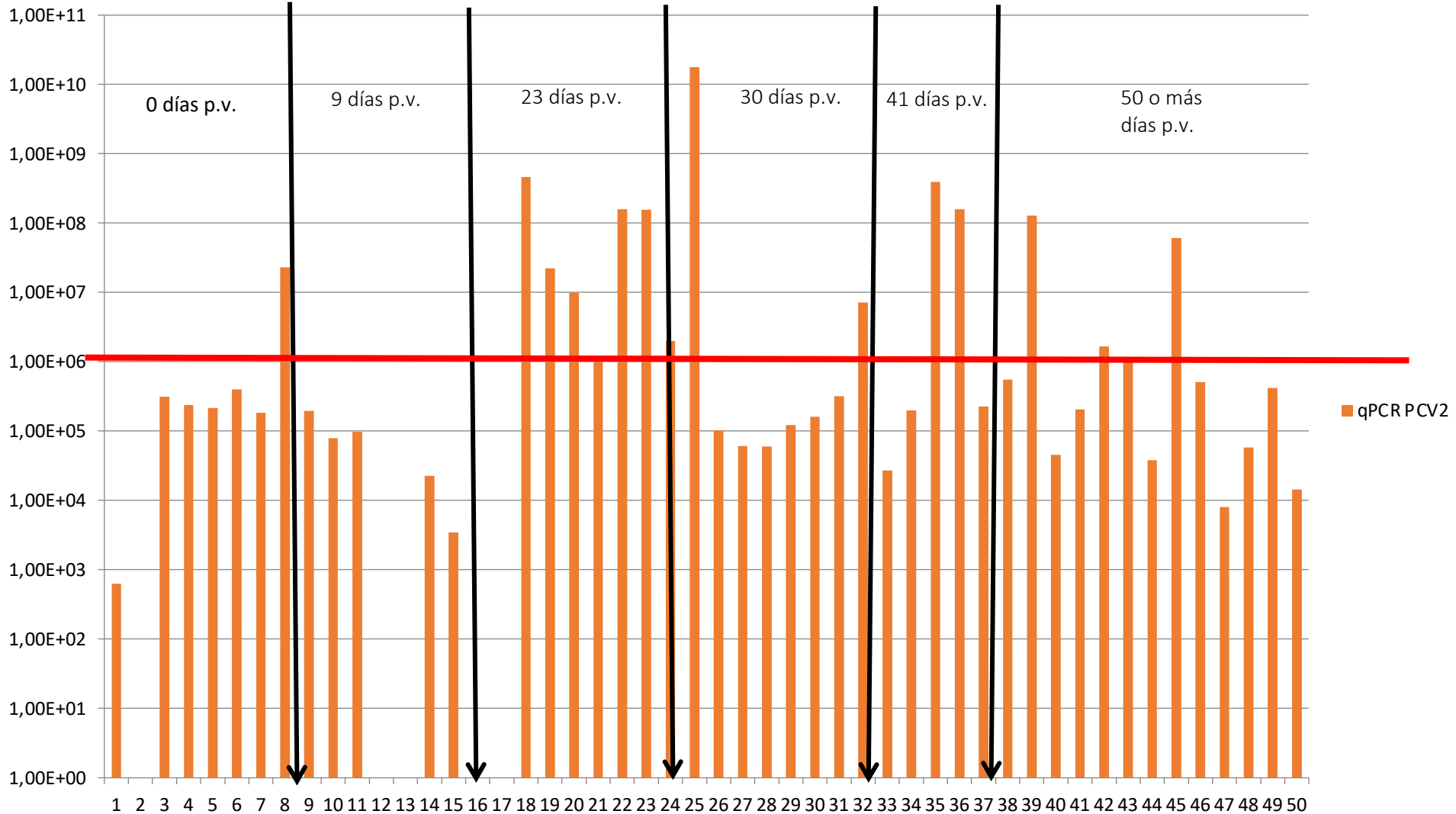




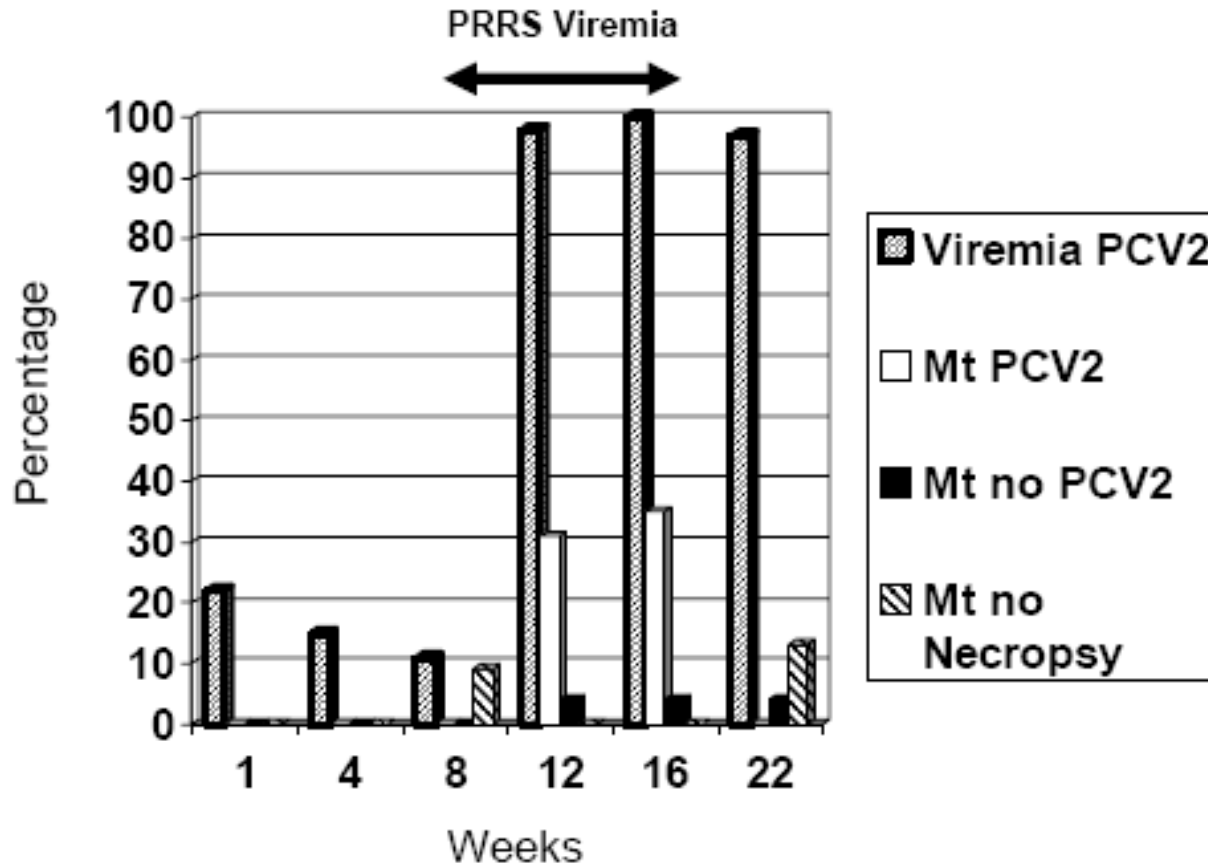
Cuando la vacuna en lechones no funciona



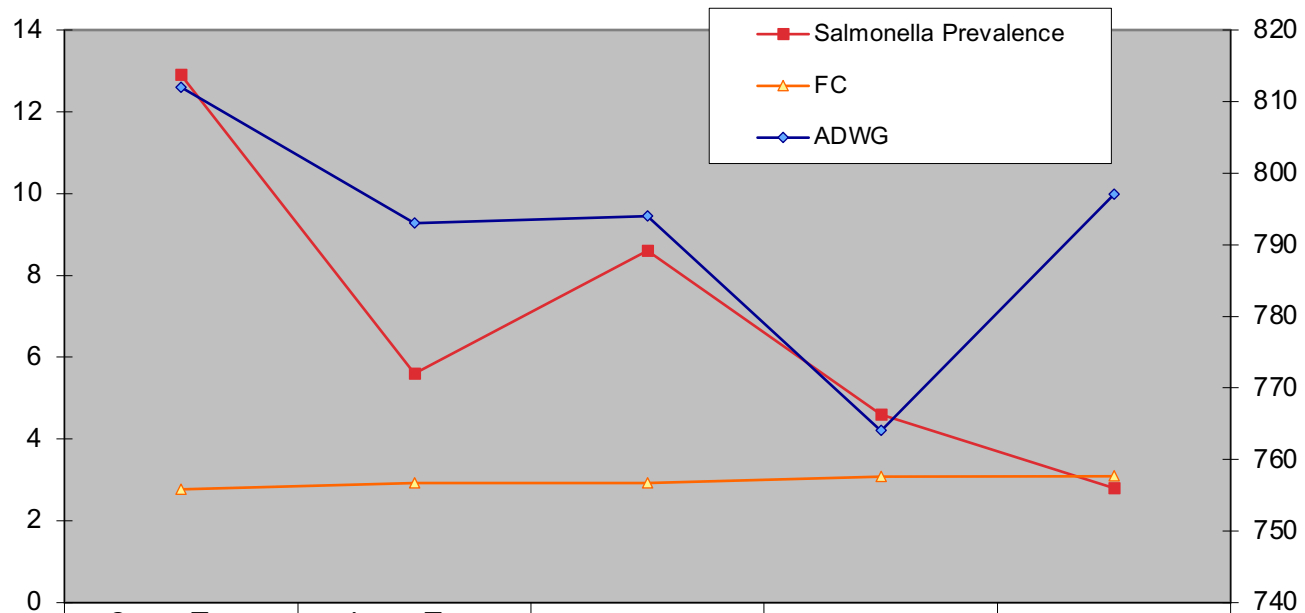
qPCR PCV2



Alta mortalità >30% (n=2)



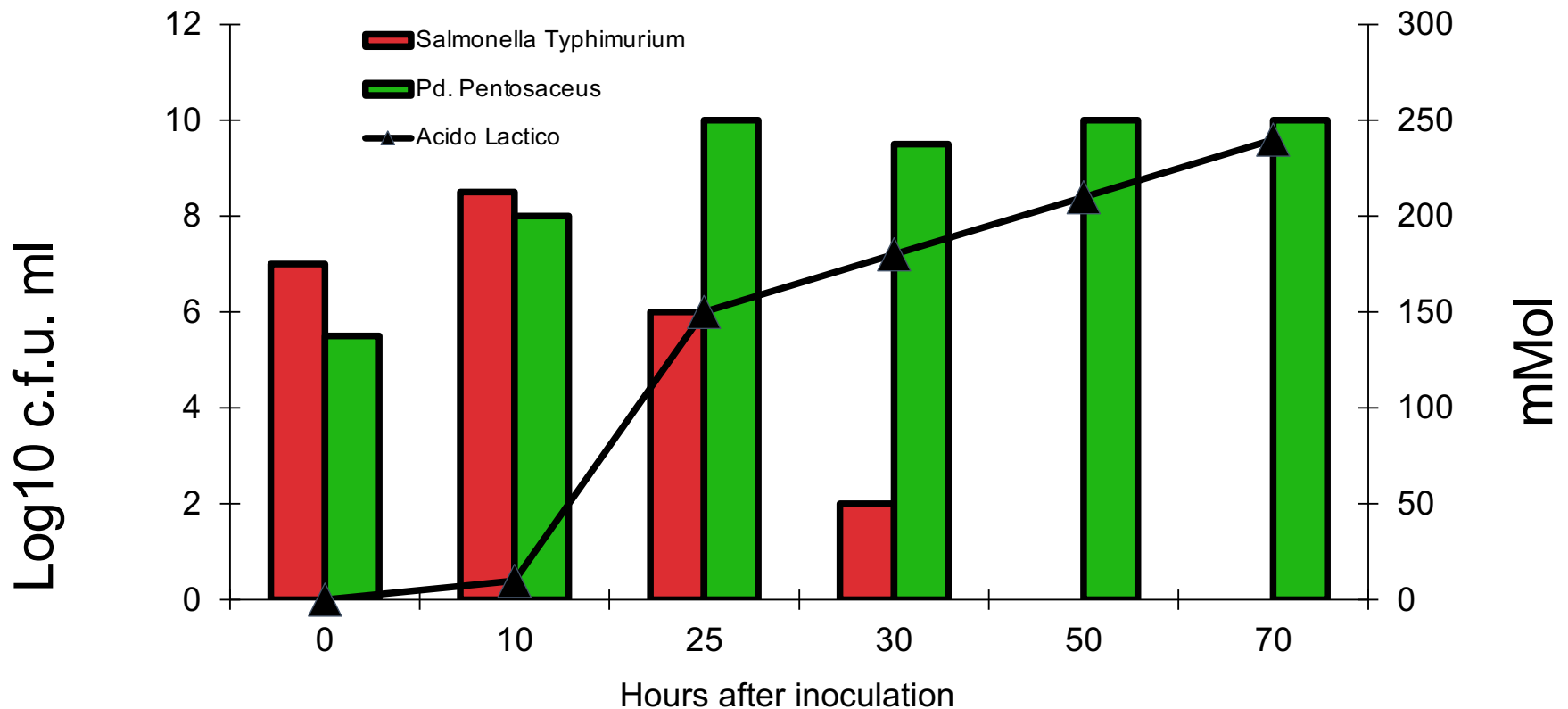
Alimentazione: Dimensione delle particelle



	2mm Exp. Gran.	4mm Exp. Gran.	4mm Gra.	4mm. Exp.	4mm
Salmonella Prevalence	12,9	5,6	8,6	4,6	2,8
FC	2,77	2,92	2,92	3,08	3,09
ADWG	812	793	794	764	797

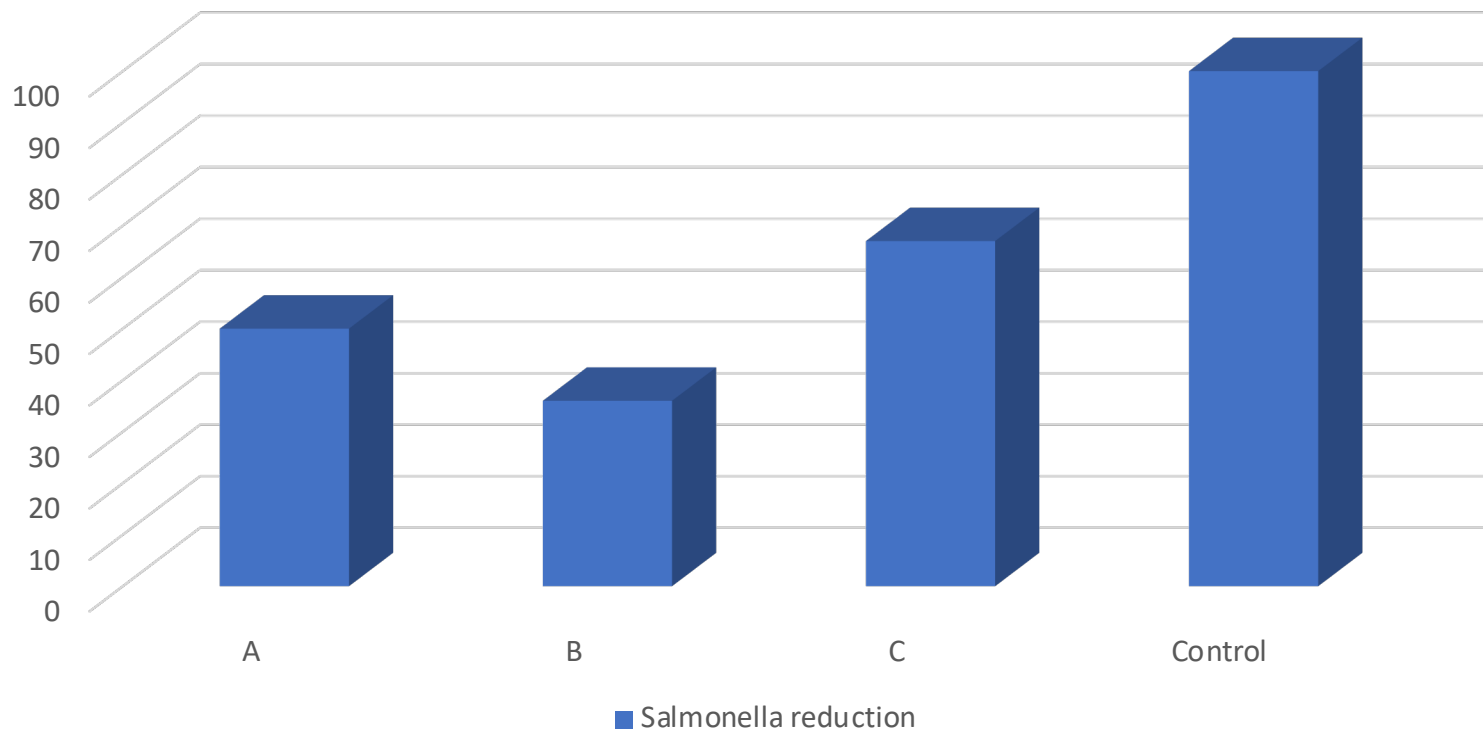
Alimentazione: Acidificazione

- Alimentazione liquida fermentata



Alimentazione: Integratori alimentari

Salmonella reduction
feces, cecal content and lymph-nodes at slaughterhouse



A: Butyric acid

B: Short Chain organic acids + natural extracts

C: MCFA + Lactic acid + oregano oil

Rasschaert G. et al. 2016. Effect of Organic Acids on Salmonella Shedding and Colonization in Pigs on a Farm with High Salmonella Prevalence. Journal of food protection 79(1):51-58

Alimentazione: Integratori alimentari

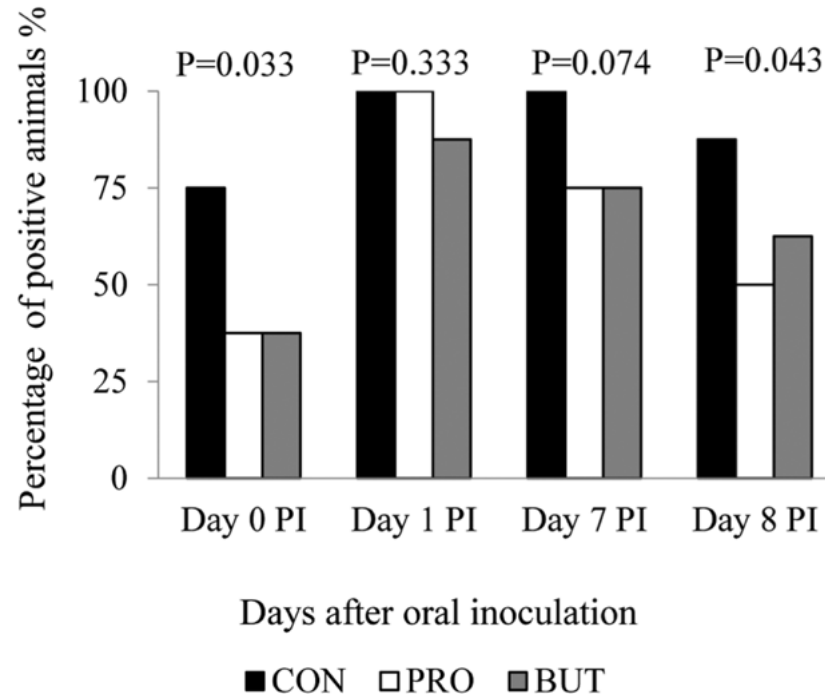


Figure 1. Percentage of *Salmonella* shedders along the post-inoculation (PI) period. Percentage of animals ($n = 8$) that showed *Salmonella* in feces at d 0, 1, 7 post-inoculation (PI) or colon digesta at d 8 PI. P-values obtained by Fisher's exact test. Treatments: CON, plain diet without additives; PRO, plain diet with 1 kg/t of Proporc (10^9 cfu/kg of feed of *Bacillus licheniformis*); BUT, plain diet with 3 kg/t of Gustor BP70 (2.1 g of partially protected sodium butyrate salt/kg of feed).

Vaccinazione

Vaccini stabulogeni spenti

- *S. Typhimurium*
- Scrofe 75 + 100 giorni di gestazione
- Suinetti 28 + 56 giorni di vita

Ruggeri, J. *et al.* 2015. Inactivated *Salmonella enterica* serovar Typhimurium monophasic variant (*S. Typhimurium* 1,4,[5],12:i-) in sows is effective to control infection in piglets under field condition. *Veterinary Microbiology* 180 (2015) 82–89

Salmonella shedding in pigs faeces

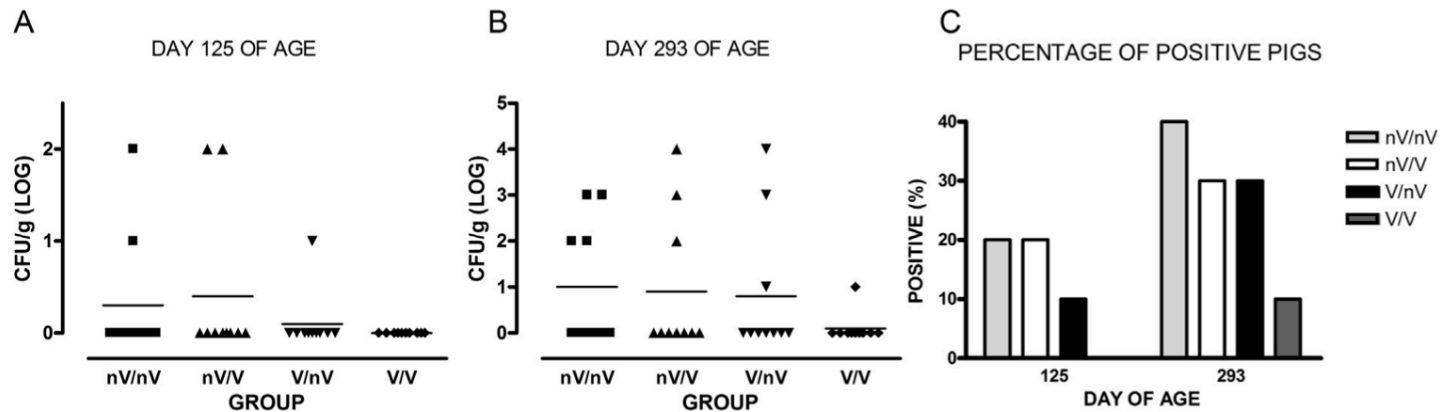


Fig. 5. Vaccination of sows and of their piglets tends to reduce number of shedder pigs during the growing-fattening stage. In (A and B), each symbol represents a pool of faeces collected from three pigs of the same litter belonging to the four groups (nV/nV, nV/V, V/nV, V/V) at day 125 and 293 of age and the amount of bacteria in faeces. In (C), columns represent the percentage of positive faecal samples of the four groups of pigs. No significant differences are recorded among groups in *Salmonella* contamination at each time point.

Vaccinazione

Vaccini vivo attenuato

- *S. Typhimurium*
- Scrofe 6 + 3
settimane prima
del parto
- Suinetti 3 + 25
giorni di vita
- Ingrasso 11-12 +
14-15 settimane
di età

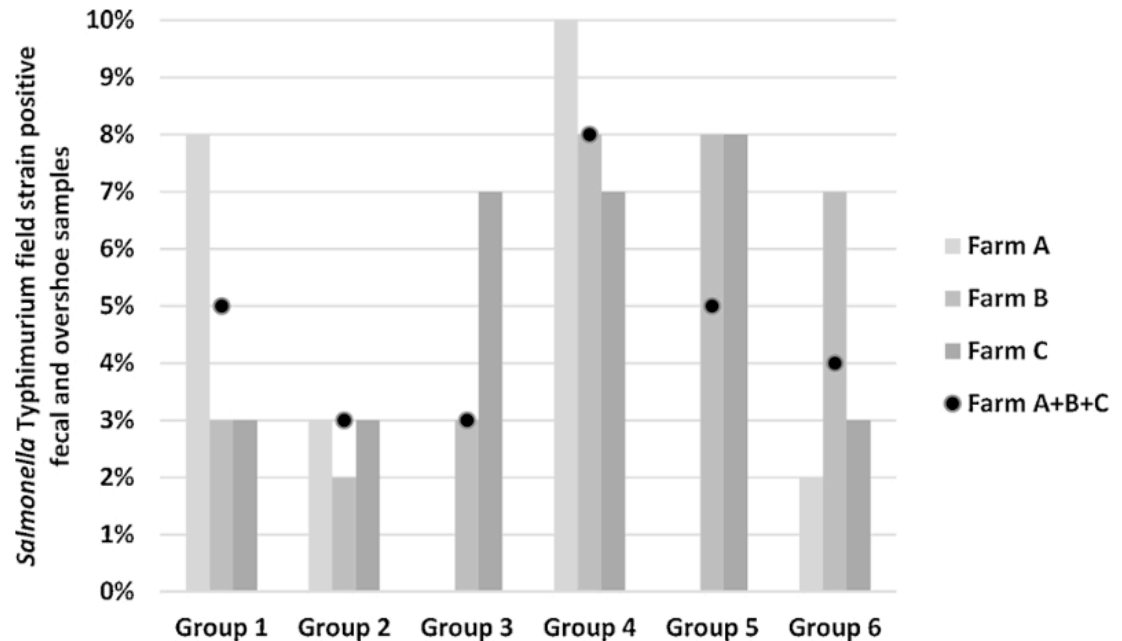


Fig. 1. Percentage of *Salmonella Typhimurium* field strain positive fecal and overshoe samples collected from the growing and fattening pigs in the different experimental groups¹ on farm A, B and C in production cycle 1 and 2.

¹Group 1: vaccination of sows, group 2: vaccination of sows and piglets, group 3: vaccination of sows and fattening pigs, group 4: vaccination of piglets, group 5: vaccination of fattening pigs, group 6: non-vaccinated control group. Sows, piglets and fattening pigs were vaccinated against *Salmonella Typhimurium* with an attenuated histidine-adenine auxotrophic vaccine (Salmoporc®, IDT Biologika).

Vaccinazione

- Protocolo combinato
 - *Salmonella* Typhimurium attenuato orale
 - *Salmonella* Choleraesuis spento intamuscolare
- A: Protocolo combinato
- B: Doppio intervento vaccina *S. Choleraesuis*
- C: Controllo

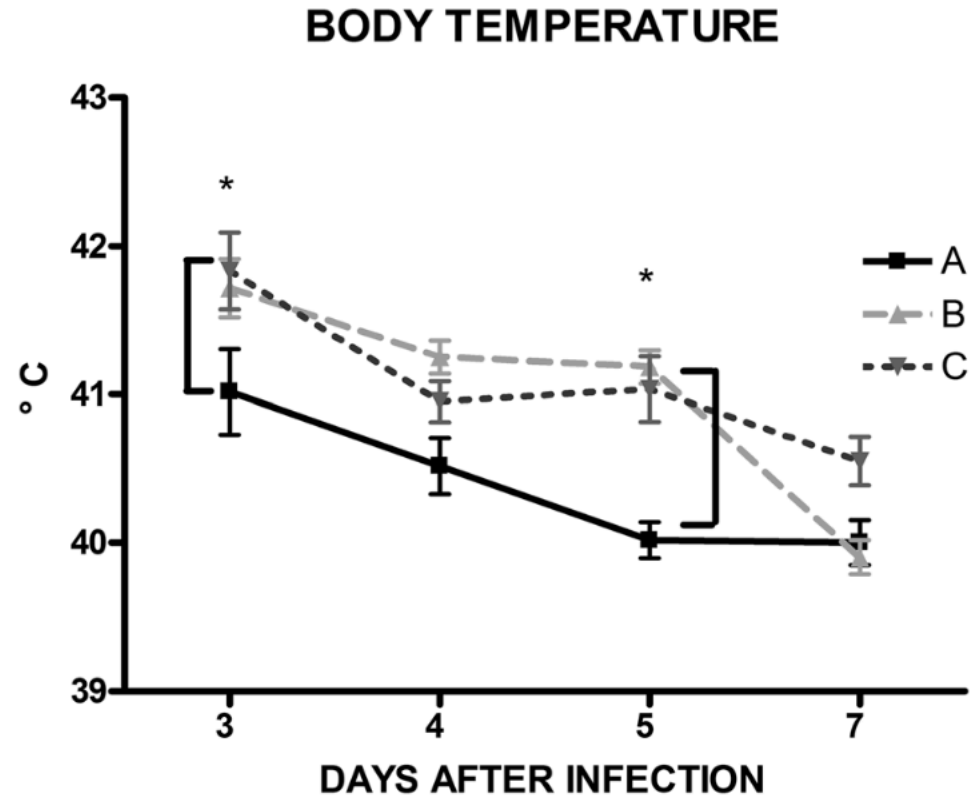


Fig. 2 Vaccination with attenuated *S. Typhimurium* $\Delta znuABC$ prevents fever. Body temperature of groups A, B and C is shown at different time points (day 3, 4, 5 and 7 after challenge). Symbols represent mean and bars standard deviation. Symbols (*) represent differences statistically significant among groups with $p < 0.01$

Vaccinazione

SCIENTIFIC REPORTS



OPEN

**Recombinant attenuated
Salmonella Typhimurium with
heterologous expression of
the *Salmonella* Choleraesuis
O-polysaccharide: high
immunogenicity and protection**

Received: 10 February 2017

Accepted: 3 July 2017

Published: 28 July 2017

Xinxin Zhao^{1,2,3}, Qinlong Dai³, Dekang Zhu^{1,2,3}, Mafeng Liu^{1,2,3}, Shun Chen^{1,2,3},
Kunfeng Sun^{1,2,3}, QiaoYang^{1,2,3}, Ying Wu^{1,2,3}, Qingke Kong^{3,4} & Renyong Jia^{1,2,3}

Grazie