

# Effect of extruded linseed, vitamin E and polyphenols pig dietary supplementation on microbial growth of meat during refrigerated storage

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## State of the art

One of the key issues for the meat industry is the shelf life extension of fresh meat by delaying both oxidation and microbial growth. It is, therefore, necessary to control meat spoilage in order to increase its shelf life and maintain its nutritional value, texture and flavor (Dave and Ghaly, 2011). In recent years, antioxidants dietary supplementation has been proposed to improve the stability of color and fatty acids with consequent extension of meat shelf life. The aim of this work was to study the effect of extruded linseed, vitamin E and polyphenols dietary supplementation on microbial growth of pork coming from pigs fed with 5% extruded linseed from about 80 kg live weight till to slaughtering (144.7±7.2 kg).

## Materials and Methods

Twenty-four Large White pigs were fed with four different diets (Table 1). At 24 h post mortem (*p.m.*), *Longissimus dorsi* (LD) muscle was sliced and packed under modified atmosphere (35% CO<sub>2</sub>, 65% O<sub>2</sub>) and stored at 2±1°C in darkness for 4, 6, 8 and 12 days. The microbial load was determined using brain heart infusion agar, BHIA, for the enumeration of mesophilic aerobic bacteria and violet red bile glucose agar, VRBGA, for the *Enterobacteriaceae*.

Diets	C	L	LE	LP
Extruded linseed	—	5%	5%	5%
Selenium	0.1 ppm	0.1 ppm	0.3 ppm	0.1 ppm
Vitamin E	50 ppm	50 ppm	250 ppm	50 ppm
Grape extract	—	—	—	2.87 g/kg of feed
Aqueous extract of oregano	—	—	—	2 g/kg of feed

Table 1. Pigs diets

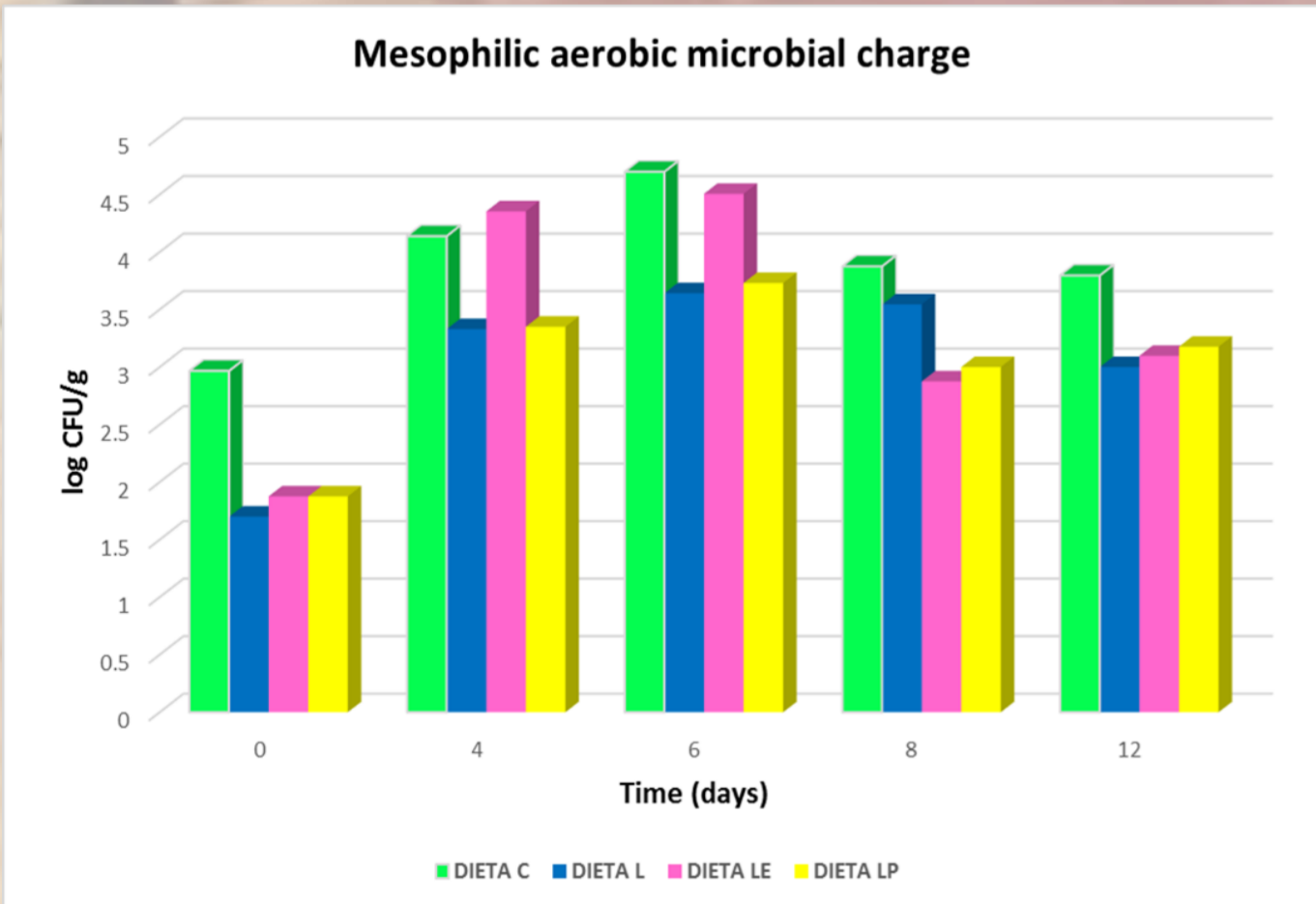
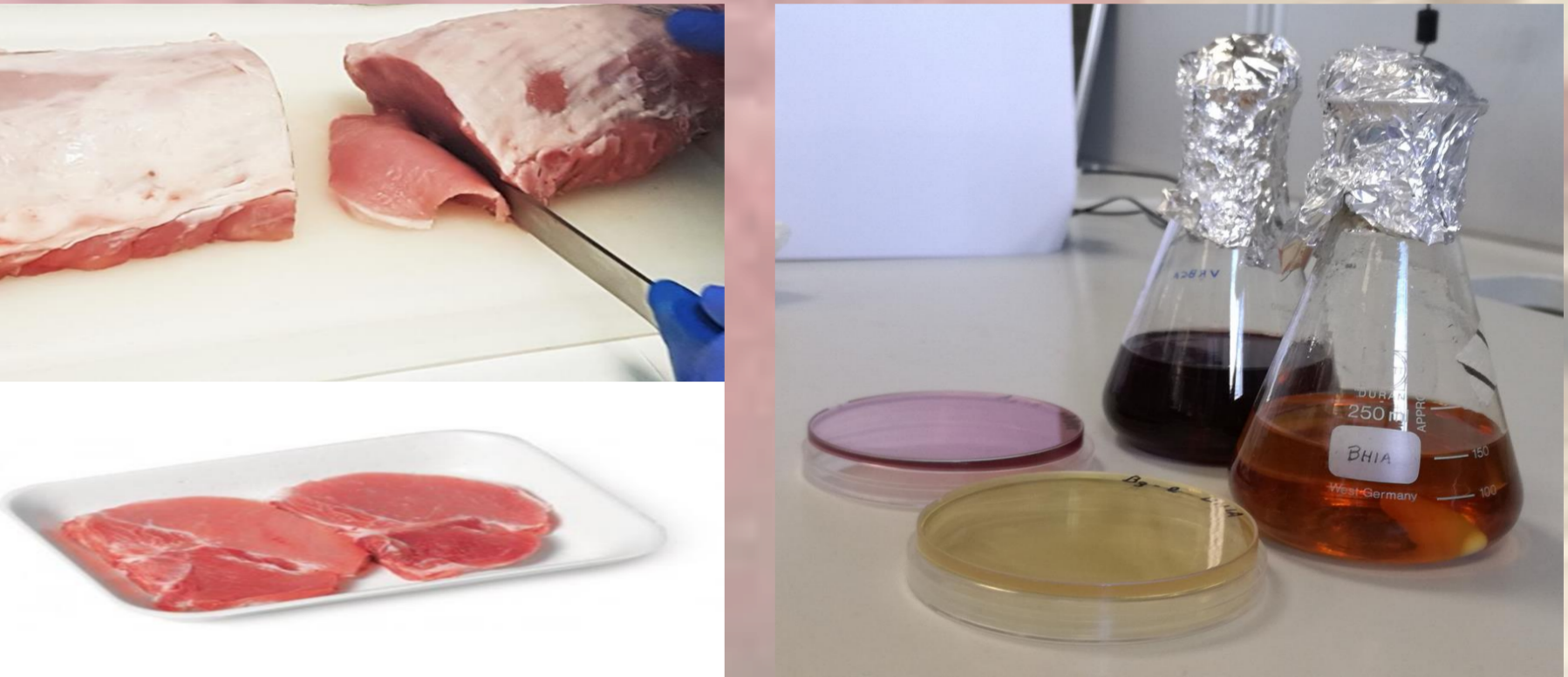


Fig. 1 Mesophilic aerobic microbial load

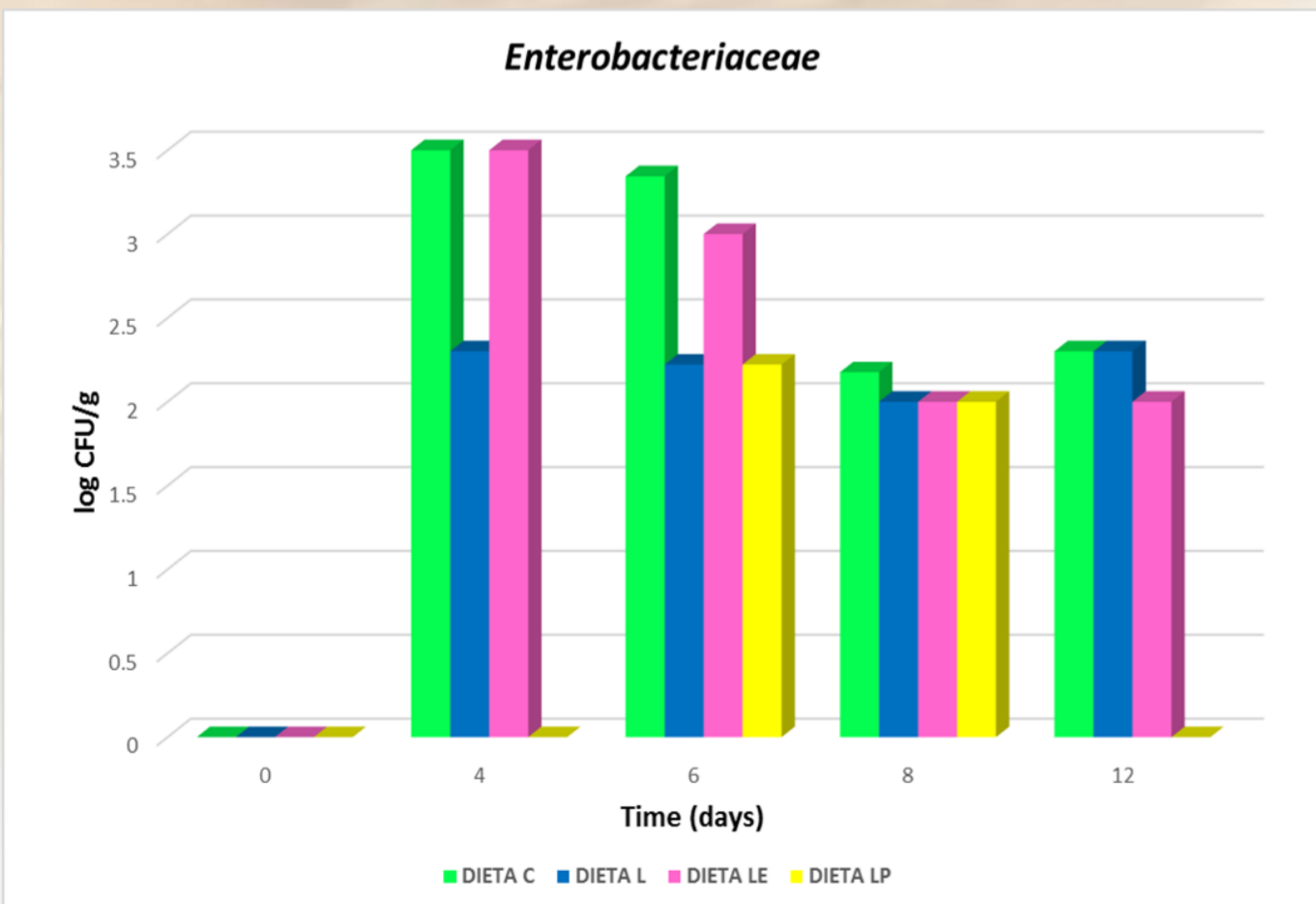


Fig. 2 Enterobacteriaceae of the meat

## Results and Discussion

At 24 h *p.m.*, the mesophilic aerobic microbial load was similar in L (50 CFU/g), LE (75 CFU/g), and LP (60 CFU/g) groups, but lower compared with C (875 CFU/g) group (Fig. 1). At the end of storage time, the microbial load for L, LE and LP groups were about 10<sup>3</sup> CFU/g, without significant differences among them. Instead, the final value for group C was about 10<sup>4</sup> CFU/g. For *Enterobacteriaceae*, the microbial load at 24 h *p.m.* was the same for all groups and equal to zero (Fig.2). During the storage the LP group showed a lower microbial load than other groups. These results could point out that dietary polyphenols, vitamin E and linseeds supplementation can increase the shelf life of pork packaged under modified atmosphere. However, taking into consideration the microbial load evolution, groups L and LP showed a lower viable count during the entire storage period.

## Bibliography

D. Dave and A.E. Ghaly, 2011. Meat Spoilage Mechanisms and Preservation Techniques: A Critical Review. American Journal of Agricultural and Biological Sciences 6 (4): 486-510

## Aknowledgements

The research was funded by POR FESR Emilia Romagna 2014-2020 (PG/2015/730542- "Innovare la filiera suina mediante la valorizzazione di sottoprodotti vegetali e l'impiego di avanzate tecnologie "omiche" e di processo, per la produzione sostenibile di carne e salumi ad impatto positivo sulla salute").