



Original Contribution

**STUDY OF THE INFLUENCE OF *OREGANO EXTRACT* SUPPLEMENTATION
IN WEANED PIGS OF THE EASTERN BALKAN BREED**

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ABSTRACT

An experiment with 30 weaned pigs of the East Balkan pig breed was conducted at the Agricultural Science Center in Sredets. The aim of the study was to determine the effect of oregano extract supplementation on the productivity and health status of weaned pigs of the East Balkan breed.

The animals were divided into two groups of 15 animals, 8 males, and 7 females. The experiment started at 8,150 kg live weight for group I (control) and 8,160 kg for experimental group II. The animals from the control group received wheat: barley (50:50), and 50 g of *oregano extract* per 100 kg of feed was added to the ration of animals from experimental group II. The experiment finished at 19.646 kg live weight for group I and at 20.673 kg live weight for those in group II. The use of *oregano extract* (*Origanum vulgare*) in the feed for weaned pigs of the East Balkan breed improved the average daily gain (by 8.96%-0.146 kg vs. 0.134kg) and reduced the feed conversion ratio per kg gain by 8.22% (5.240kg vs. 5.709 kg).

Key words: swine, additives, daily gain, feed conversion ratio

INTRODUCTION

Phytogenic additives are a new class of feed additives that do not include organic acids and probiotics, which are already better studied in animal nutrition. Knowledge about phytogenic supplements, their application, and also their botanical origin, processing, and composition is limited (1).

Following the EU and the United States, China has also introduced a ban (from 1 July 2020) on antimicrobial growth promoters in weaned piglets. However, the problems of poor gut health and low growth performance of weaned pigs have not been fully resolved in antibiotic-free rations. (2), making it necessary to explore alternatives to antimicrobial growth promoters.

The therapeutic effect of *oregano extract*, due to the content of carvacrol and thymol, has been

established by a number of authors (3, 2). Carvacrol and thymol are phenolic monoterpenoids that are extracted from *Origanum vulgare*. Carvacrol and thymol have been shown to exert various physiological activities, such as antimicrobial, anti-inflammatory, antioxidant, immune modulation, and improvement of intestinal morphology and integrity of the intestinal mucosa (4-7). Thus, carvacrol and thymol are widely used as substitutes for antibiotics in animal rations.

The aim of the study was to determine the effect of oregano extract supplementation on the productivity and health status of weaned pigs of the East Balkan breed.

MATERIAL AND METHODS

An experiment with 30 weaned pigs of the East Balkan pig breed was conducted at the Agricultural Science Center in Sredets. The animals were divided into two groups of 15 animals, 8 castrated males and 7 females. They were reared in open pens with 15 animals in each

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pen. The pigs were fed with the same rations and had access to water ad libitum from water trays. The experiment started at 8,150 kg live weight for group I (control) and 8,160 kg for experimental group II. The animals of the control group received wheat: barley (50:50), and 50 g of oregano extract per 100 kg of feed was added to the ration of animals from experimental group II. The experiment continued for 86 days, reaching 19.646 kg live weight for group I and 20.673 kg live weight for those in group II.

The chemical composition of the feed samples was determined according to the methods adopted in Agricultural institute -Shumen.

Protein was determined by the Kjeldahl method. Crude fats - by using the Soxhle extraction apparatus, fibers by the Weende method. Calcium was determined by the oxalate method, and phosphorus by the molybdate method of Gerike and Kurmis.

Digestible and metabolizable energy was calculated based on digestible nutrients from our studies and using the following equations,

digestible energy (CE) = 5.78 x digestible protein (g) + 9.42 x digestible fat (g) + 4.40 x digestible fiber (g) + 4.07 x digestible NFS (g).

Metabolizable Energy (OE) = 5.01 x digestible Protein (g) + 8.93 x digestible Fat (g) + 3.44 x digestible fiber (g) +4.08 x digestible NFS (g).

The results from the experiment were analyzed using methods for variation statistics.

RESULTS AND DISCUSSION

Table 1 presents the chemically analyzed feeds - barley and wheat - with which the animals were fed. The analyzes were done in the Feed Laboratory at the Agricultural Institute - Shumen. Pigs from the control group were fed with wheat: barley (50:50), and those from the experimental group with the same feed, to which was added *Oregano extract* in a dose of 50 g per 100 kg of feed. The nutritional value of the fed feed was low, as only grain feed was included. This was the practice of feeding the animals of this breed, bearing in mind its phylogenetically determined ability to utilize natural trophic sources with low nutritional value (8, 9).

Table 1. Energy and nutrient content in 1 kg feed

Indicators	Barley	Wheat
Metabolizable energy ** MJ	12,45	13,44
Dry matter, %	88,53	85,93
Organic matter, %	85,76	82,94
Crude protein,%	8,07	10,42
Crude fibers, %	3,62	2,12
Mineral substances, %	2,77	2,99
Lysine*, %	0,30	0,30
Methionine+Cystine*, %	0,37	0,41
Tryptophane*, %	0,11	0,15
Treonine*, %	0,25	0,34
Calcium, %	0,166	0,156
Phosphorus, %	0,316	0,292

** Based on our analyzed laboratory data

* Data were calculated according to literature sources and the analyzed protein

The inclusion of the *Oregano* supplement in the feed had no effect on the daily feed consumption - the average feed intake per animal per day for both groups was the same -0.765kg.

Supplementation of *Oregano extract* increased growth intensity by 8.96% (0.146 kg average daily gain), compared to animals that did not receive the supplement (**Figure 1**). The

significance of the differences was close to proven. In terms of feed conversion ratio per kg gain, a lower feed conversion was recorded in the animals of the group that received the supplement (**Figure 2**) – 5.240 kg/kg gain, with 8.22% to the pigs of I group (5.709 kg/kg gain). *Oregano* supplementation helped reduce harmful bacteria

and improved the integrity of the intestinal structure by reducing oxidative stress and the body's inflammatory response, which provided improved growth in weaned pigs (2). This was probably due to the beneficial effect of *Oregano extract* supplementation on average daily gain and feed conversion ratio per kg gain.

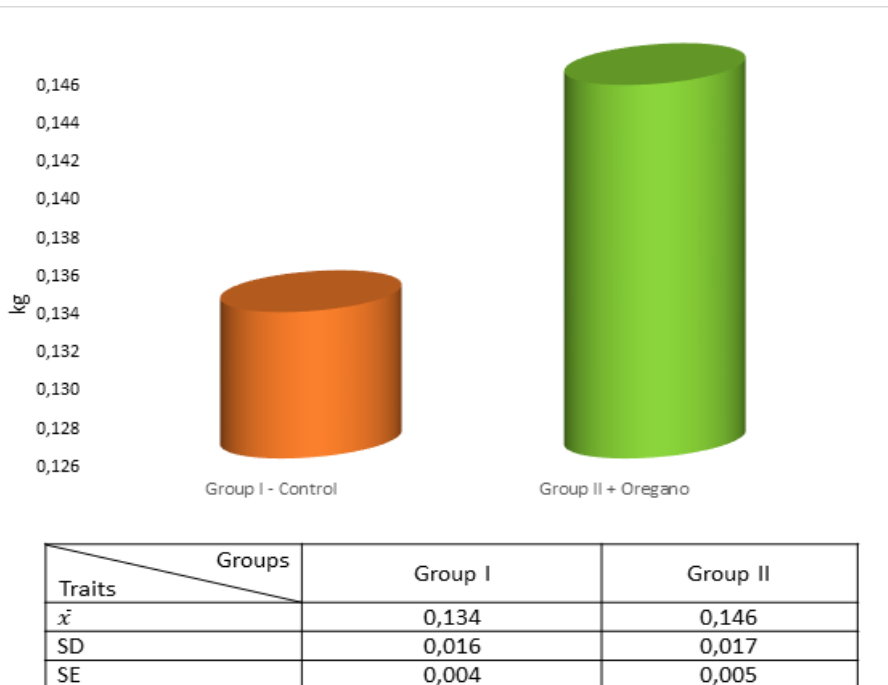


Figure 1. Average daily gain, kg

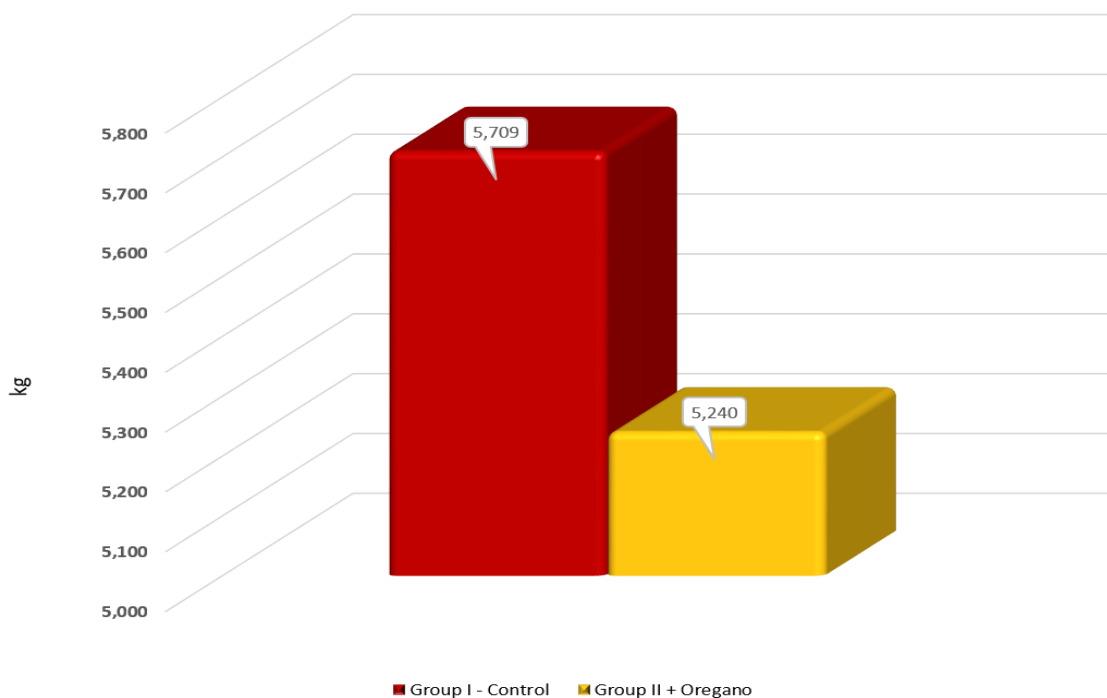


Figure 2. Feed conversion ratio per kg gain

Research by Wang and et al., (2022) (2) indicate that adding *oregano* to weaned pig rations increased live weight and growth, but did not affect feed utilization. The authors suggest that *oregano* reduces *PUN* (*plasma urea nitrogen*) content, leading to increased utilization of amino acids, which promotes growth.

Tan et al. (2021) (10) indicated that *PUN* (*plasma urea*) content in weaned pigs was significantly reduced by feeding rations containing carvacrol and thymol.

Intestinal oxidative stress and inflammatory response during weaning are one of the causes of intestinal barrier function impairment (11, 12).

Dietary supplements such as oregano significantly alleviate weaning oxidative stress due to their strong antioxidant activity and free radical scavenging and inhibition of lipid peroxidation (13, 14).

Ivanova – Peneva et al. (2010) (3) found that the use of the herbs *Origanum vulgare* and *Potentilla Erecta Raus* in the compound feed of suckling pigs improved the gain by 11% ($P < 0.01$) for the suckling period and live weight at weaning 7.5 kg versus 6.883 kg and 6.944 kg.

CONCLUSION

The addition of *Oregano extract* (*Origanum vulgare*) in the feed for weaned pigs of the East Balkan breed showed a tendency for improvement of the growth intensity (by 8.96%-0.146 kg vs. 0.134kg) and reduced the feed conversion ratio per kg gain by 8.22% (5.240kg vs. 5.709 kg).

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