



Life Force

**From Healthy Animals and Birds
to Healthy People**

The international innovative group of companies **Life Force** includes:

- Manufacturing enterprises and offices in Lithuania, Ukraine and Russia.
- Research and Development Center for the study of humic acids and their practical application in the field of ensuring healthy nutrition of animals, people and plants.

We create highly effective eco-friendly feed materials and supplements, fertilizers for plants and soil, which:

- help to grow high-quality and safe animal and plant products, that, as a result, improve people's health and quality of life;
- help to ensure competitive poultry farming, pig breeding, dairy and beef cattle breeding, fish farming and crop cultivation.





Our goal is to contribute to the maintenance and improvement of the health of the soil, plants, animals, human and the planet, **as a single and indivisible whole.**

- **Since 2001** Life Force has been producing humic and micronutrient fertilizers for plants and soil.
- **In 2014** the production of products for the recovery and improvement of fertility of all types of soils was launched.
- **In 2017** Life Force designed the **Reasil® Technology** which is based on environmentally friendly and efficient products Reasil® for poultry and livestock.

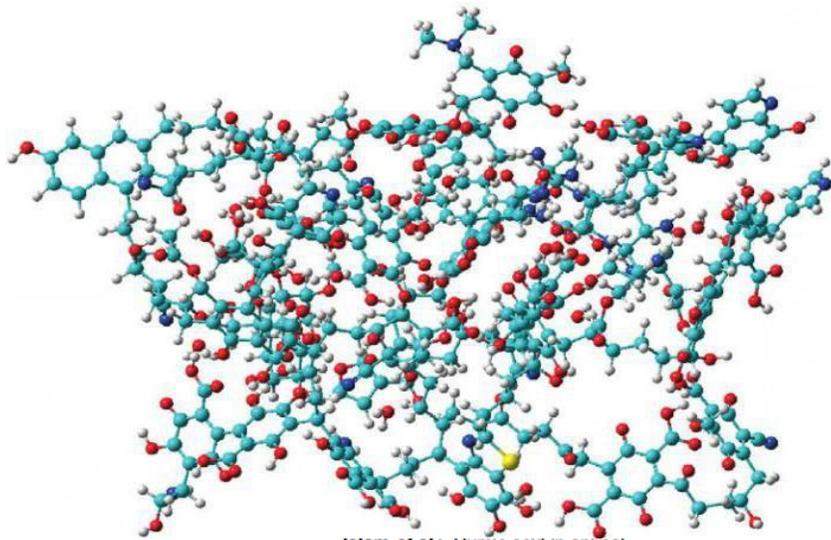


Leonardite- Feed material

Product that is a naturally occurring mineral complex of phenolic hydrocarbons, also known as humate, which originates from the decomposition of organic matter over the course of millions of years.

Commision Regulation (EC) Nr. 68/2013 list of feed materials Nr. 13.10.2





Islam et al.: Humic acid in animal

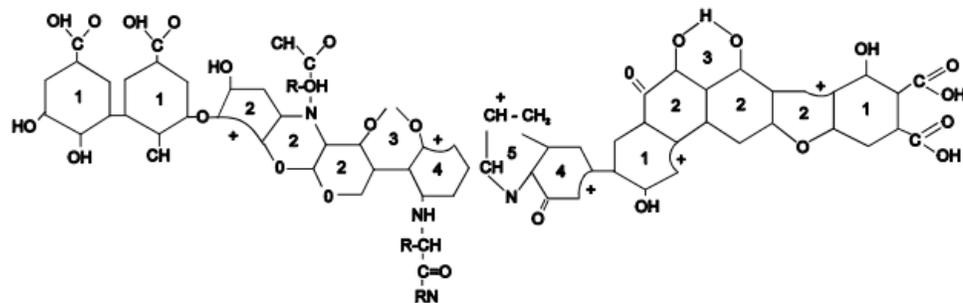


Fig. 1: Oxidized HA molecule

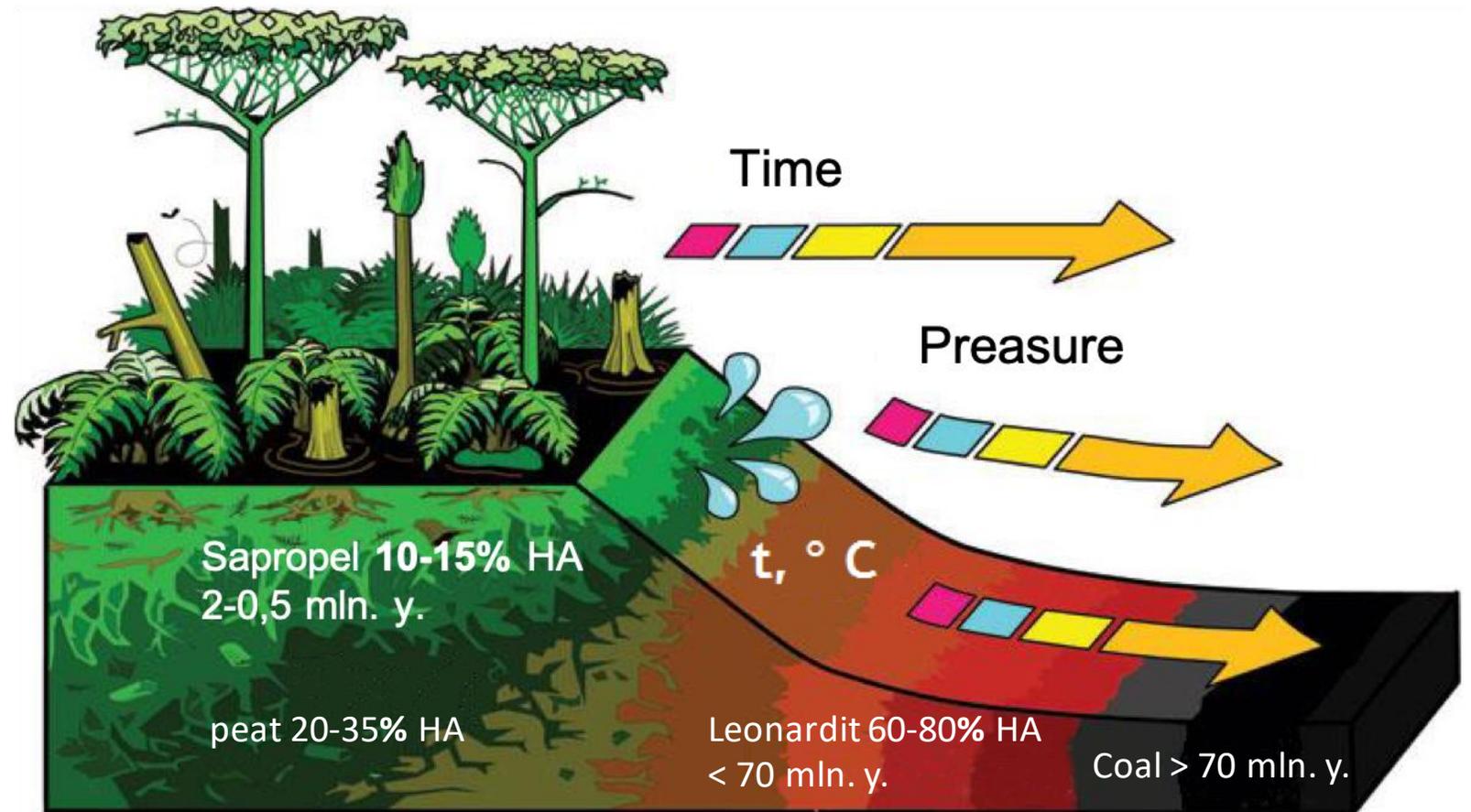
Our products

Feed materials from LEONARDITE → HUMIC ACIDS

Chemical composition of Humicacids:

Natural amino acids, polysaccharides, peptides, minerals, vitamins, sterines, fatty acids, polyphenols, ketone and its subgroups including flavonoids, flavins, isoflavons, catechins, tanning materials, quinones and tocopherols, macro and micro elements: **N, P, K, S, Na, Ca, Mg, Cu, Fe, Mn, Ni, Zn, Co, Si, Se**, and others, which ancient plants consist of. There are more than **70 vitally important elements**.

**Leonardite –
naturally humified,
70 mln. years ago**





Feed material- Reasil quality and safety parameters

Quality control of each batch are performed

Nutrients, % (w/w):	In natural sample
Total humic extract:	74,9
Humic acids	67,2
Fulvic acids	7,7
Protein	6,6
Crude fiber	1,76
<i>Total nitrogen, N</i>	1,06
<i>Total phosphorus, P</i>	0,663
<i>Total potassium, K</i>	2,661
Total calcium, Ca	2,274
Total magnesium, Mg	0,199
Total sulfur, S	0,162
Total sodium Na	0,043
Total copper, Cu	0,0004
Total iron, Fe	0,643
Total manganese, Mn	0,0145
Total zinc, Zn	0,00142
Total boron, B	0,00075
Total nickel, Ni	0,00262

Feed material- Reasil quality and safety parameters

Safety control of each batch are performed

<i>Heavy metals:</i>		
Arsenic (As)	mg/kg	1,31
Cadmium (Cd)	mg/kg	<0,2
Fluorine (F)	mg/kg	<122
Lead (Pb)	mg/kg	2,84
Mercury (Hg)	mg/kg	0,037
<i>Mycotoxins:</i>		
Aflatoxin B ₁	mg/kg	<0,0012
<i>Dioxins:</i>		
Dioxins (sum of PCDD and PCDF)	ng/kg	0,13
Sum of dioxins and dioxin-like PCBs	ng/kg	0,27
Sum of non dioxin-like PCBs	µg/kg	4,868
<i>Bacteriological criteria:</i>		
Escherichia coli	1 g	<10
Enterobacteriaceae	1 g	40
Salmonella	25 g	No



Reasil® Technology is based on application of feed materials **Reasil® HumicVet** (liquid form), **Reasil® Humic Health** (solid form) and **Reasil® HumiClean**.

REASiL[®]

products are integrated
into the following
systems:



Watering system:

Water +
Reasil[®] HumicVet



+



+



Floor housing system:
Litter + **Reasil[®] HumiClean**

Feeding system:

Feed +
Reasil[®] Humic Health





Feed material Reasil® HumicVet

Liquid water-soluble feed material of a complex action for the increased productivity of livestock and poultry.

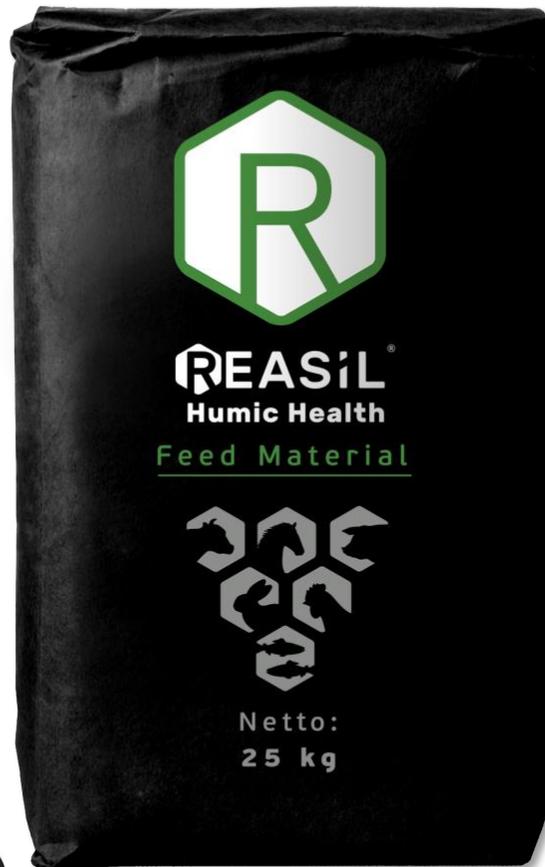
Composition:

Humic substances: 100 g/l (10 % w/v*).

pH: 10,5-11,5.

*w/v - weight/volume

Preparative form: dark-brown liquid.



Feed material Reasil® Humic Health

Biologically active feed material in powder form to increase productivity of livestock, poultry and fish. The product is of high bioavailability and efficiency.

Composition:

Humic substances in dry matter: 70-80%.
Humidity: 14% ($\pm 1\%$).

Preparative form: powder of brown color.



Litter Conditioner Reasil® HumiClean
Litter conditioner (improver) for maintenance of a clean, safe and healthy environment in poultry houses and animal barns.

Composition:

Organic matter: 60-70 %.

Minerals: 30-40 %.

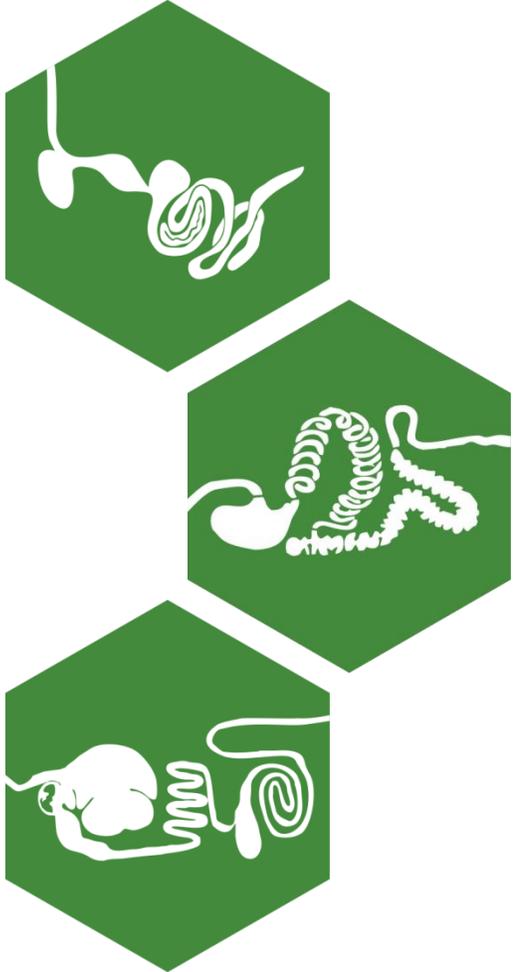
Humic substance: 40-50 %.

Humidity: 20 % (± 3 %).

pH: 6-7.

Appearance: brown powder.

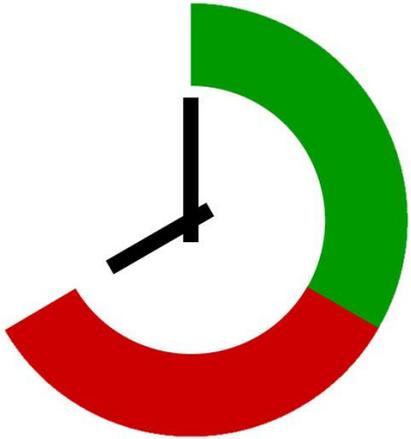
REASiL[®]
Technology



- Improves intestinal integrity of animals (Jesus A. Maguey-Gonzalez et al., 2018) .
- Covers the intestinal lumen with a protective film (S. KUCUKERSAN et al., 2005; Rath et al., 2002; Taklimi et al., 2012), blocks the reproduction of pathogenic bacteria (Klocking, 1994; EMEA, 1999; Riede et al., 1991).
- Adsorbs endotoxines, exotoxines and mycotoxins.
- Stabilizes the intestinal microflora; reduces symptoms of gastroenteritis, diarrhea and restores metabolic imbalance.
- Activates the processes of absorption of feed components.
- Improves feed conversion.



- Has a hepatoprotective function.
- Helps prevent and eliminate pathological conditions of the liver.
- Improves the quality of marketable liver.
- Reduces the period of removal of antibiotic residues from the body of animals and birds.



- Has an anti-stress effect when changing diet, after vaccination and veterinary measures, when changing conditions of housing.
- Promotes weight gain.
- Significantly improves productivity.
- Improves the quality of meat, milk and eggs.
- Increases immunity and safety of livestock.
- Gives the opportunity significantly reduce the use of antibiotics.

Benefits of Reasil[®] Technology

Reasil[®] Technology improves poultry housing and livestock litter

Reasil[®] Technology is designed for maintenance of a clean, safe and healthy environment in poultry houses and animal barns.



- Reduces unpleasant odors.
- Reduces emissions of harmful gases such as ammonia, hydrogen sulfide and methane from the litter into the atmosphere, decreasing the negative impact on the environment.
- Improves the ecological and hygienic situation in poultry houses and animal barns and creates more comfortable conditions for keeping animals and birds.
- Reduces the risk of ammonia burns to the lower limbs of animals and birds.
- Decreases the occurrence of pododermatitis.
- Ensures accelerated and more efficient composting of droppings and manure with bedding.
- Provides better manure for further use as compost or organic fertilizer.



Field trials experiences

Field trial: ROSS-308 broilers LT

Control group - 25 000 broilers

Experimental group - 25 000 broilers

Trial design:

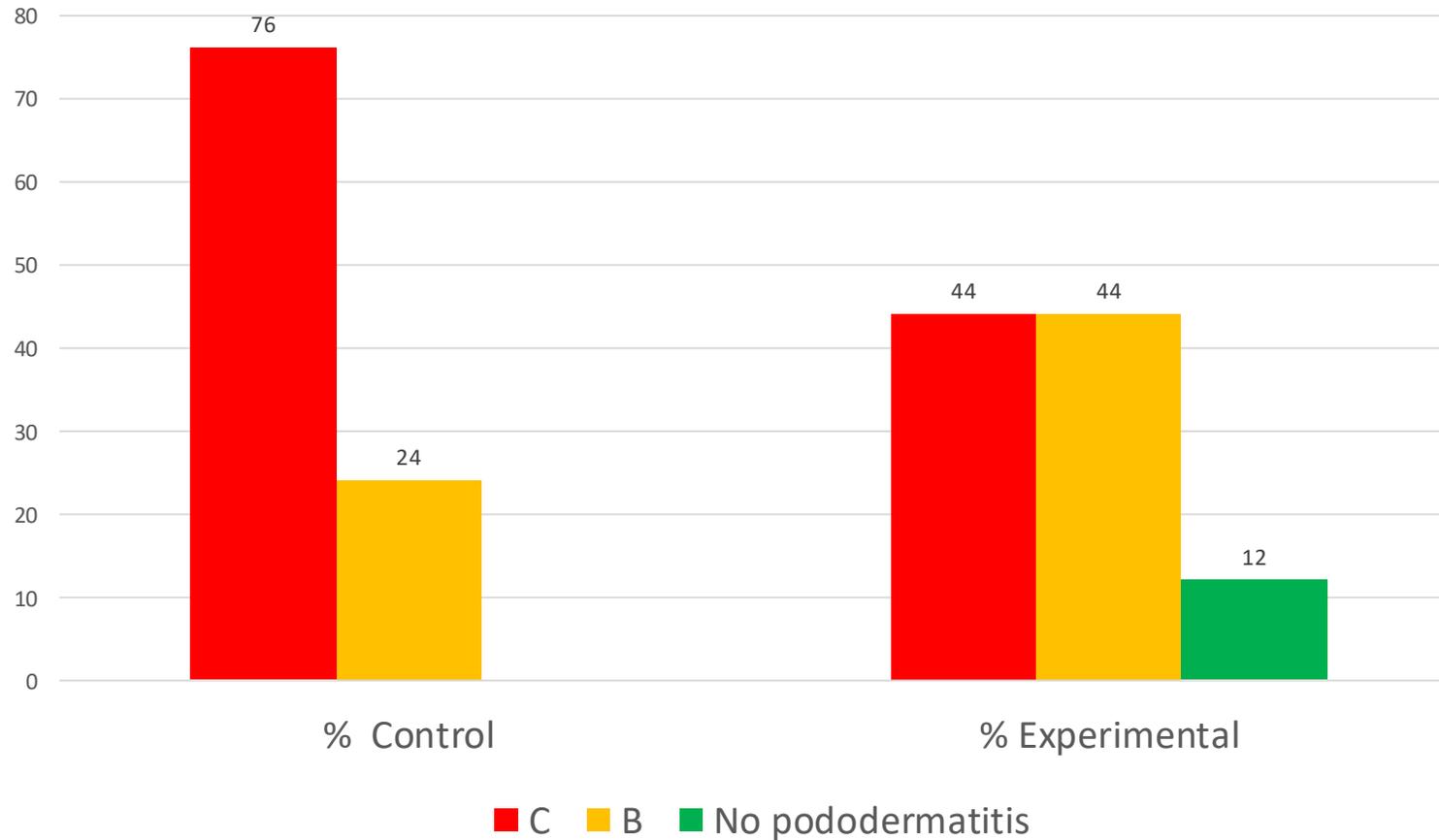
Reasil Humic Clean spread on bedding material (straw pellet) before introducing day old chicken – application rate 100g/m² floor area;

Since 9 to 30 day Reasil HumicVet in drinking water - 0,06ml/kg body weight.



Evaluation Pododermatitis on day 42

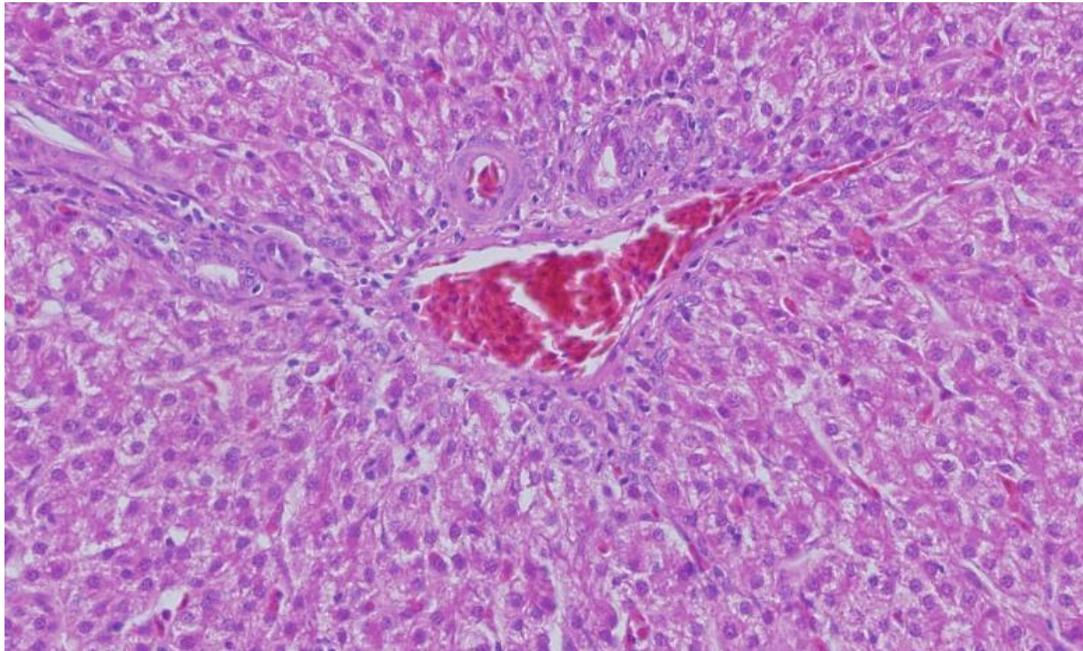
ROSS-308 broilers LT



Liver histology

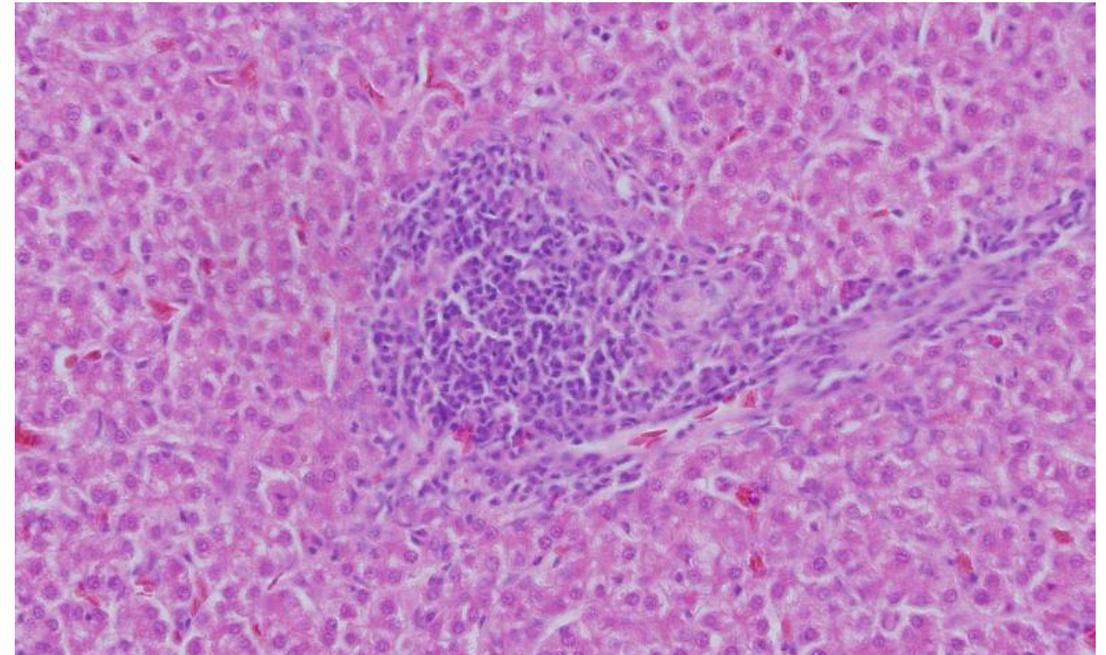
ROSS-308 broilers LT

Control



Strong hydropic degeneration, lipidosis, weak immunoresponse

Experimental



Cluster of lymphocytes and plasmacytes (a good immunoresponse), Very low hydropic degeneration and lipidosis

Reasil Humic Clean and Reasil HumicVet on ROSS-308 broilers, LT

Control group - 2 000 chickens

Experimental group - 2 000 chickens

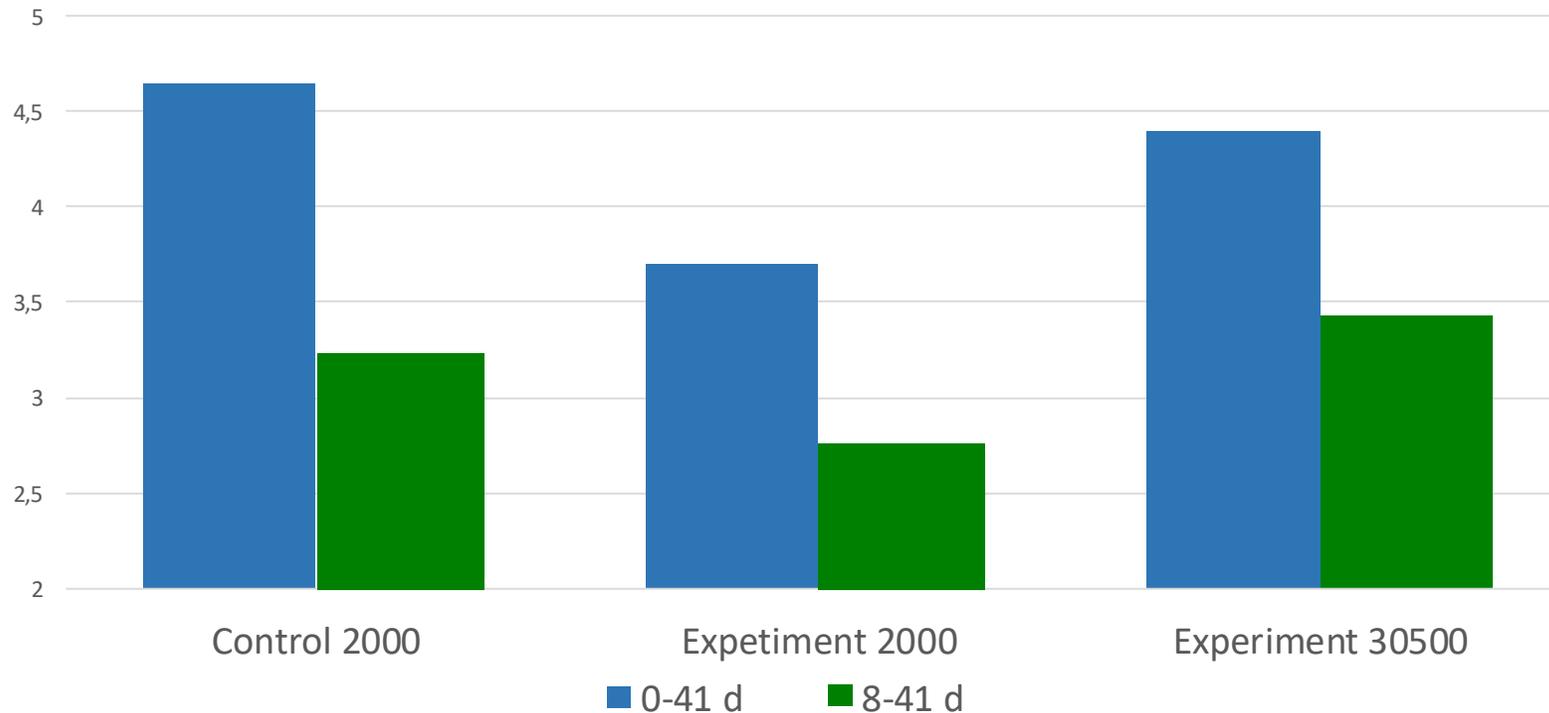
Experimental group - 30500 chickens

Protocol:

1. From 1st day of life till 24 day with drinking water Reasil HumicVet - 0,1ml/kg body weight in 2000 and 30500 chickens barns;
2. In 30500 broilers barn from day 25 Reasil Humic Health was supplied 2 kg/t of feed.

Reasil Humic Clean and Reasil HumicVet on ROSS-308 broilers in Lithuania

Mortality rate %



**Feed material – Leonardite on turkey LT
Reasil Humic Health & Reasil HumicVet**

2018



Field trial protocol on turkey, LT

- Feed material was supplied 1-42 days of age, converter breed turkeys.
- Control group size 15620 and experimental group size 16284 turkeys
- Reasil Humic Health was used in feed 2 kg/t
- Reasil HumicVet every day was given with drinking water dose 0,06 ml/kg body weight

Performenc of Results turkey

Parameters	Experimental			Control			+/- comparison to the control
	males	females	average	males	females	average	
Weight on day 1,kg	0,058	0,057	0,0575	0,063	0,061	0,062	-0,0045
Weight on day 42,kg	2,28	2,76	2,52	1,96	2,22	2,09	0,43
Liveability %	98,44	97,59	97,87	97,47	97,42	97,44	0,43
Feed conversion rate	1,69			1,87			-0,18

Within period of 42 days:

1. 20,57% higher body weight; 2. 0,43% higher liveability; 3. 9,6% less feed

Feed material –Leonardite “Reasil Humic Health” influence on broilers performance

Veterinary Academy of Lithuanian University of Health
Sciences and Kaunas University of Technology



LIETUVOS SVEIKATOS
MOKSLŲ UNIVERSITETAS



Field – Scientific trial

- Reasil Humic Health was supplied since day 1 to day 40 for broilers ROSS-308;
- Control group 90 000 and experimental group 90 000 broilers;
- Reasil Humic Health was incorporated to the compound feed - ratio 2 kg/t .

Field – Scientific trial

INDICATORS TESTED DURING THE GROWING PERIOD:

1. Average body weight on 7, 14, 21, 35 day and day of slaughter.
2. Daily body weight;
3. FCR ratio;
4. Liveability;
5. Water consumption;
6. Production efficiency factor;
7. Microclimate in poultry house: NH₃, temperature;
8. Dray mater in manure on 15 and 35 day;
9. Pododermatitis on day 35 and after slaughter (in accordance Butterworth A., University of Bristol procedure).

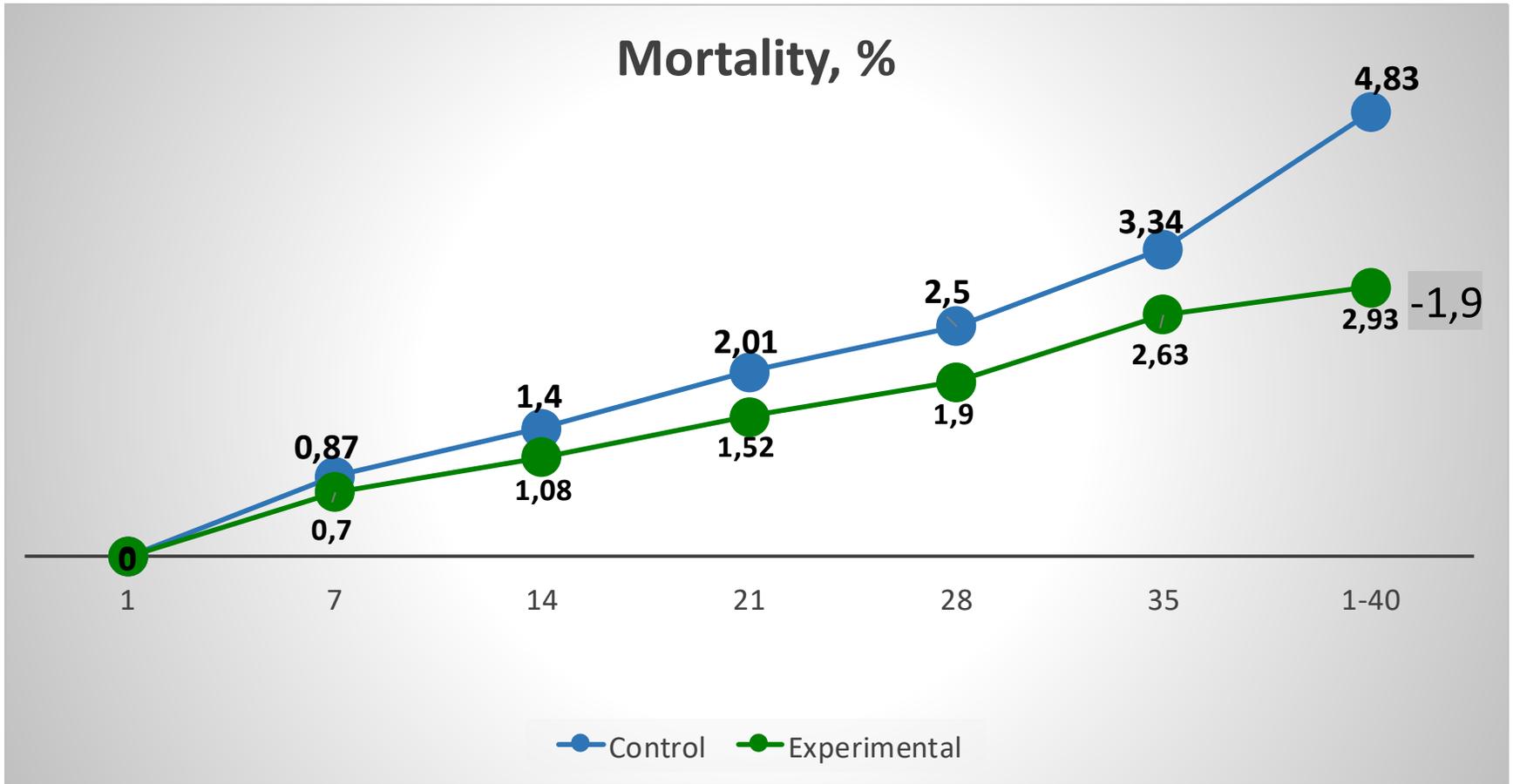
Field – Scientific trial

INDICATORS TESTED AFTER SLAUGHTER:

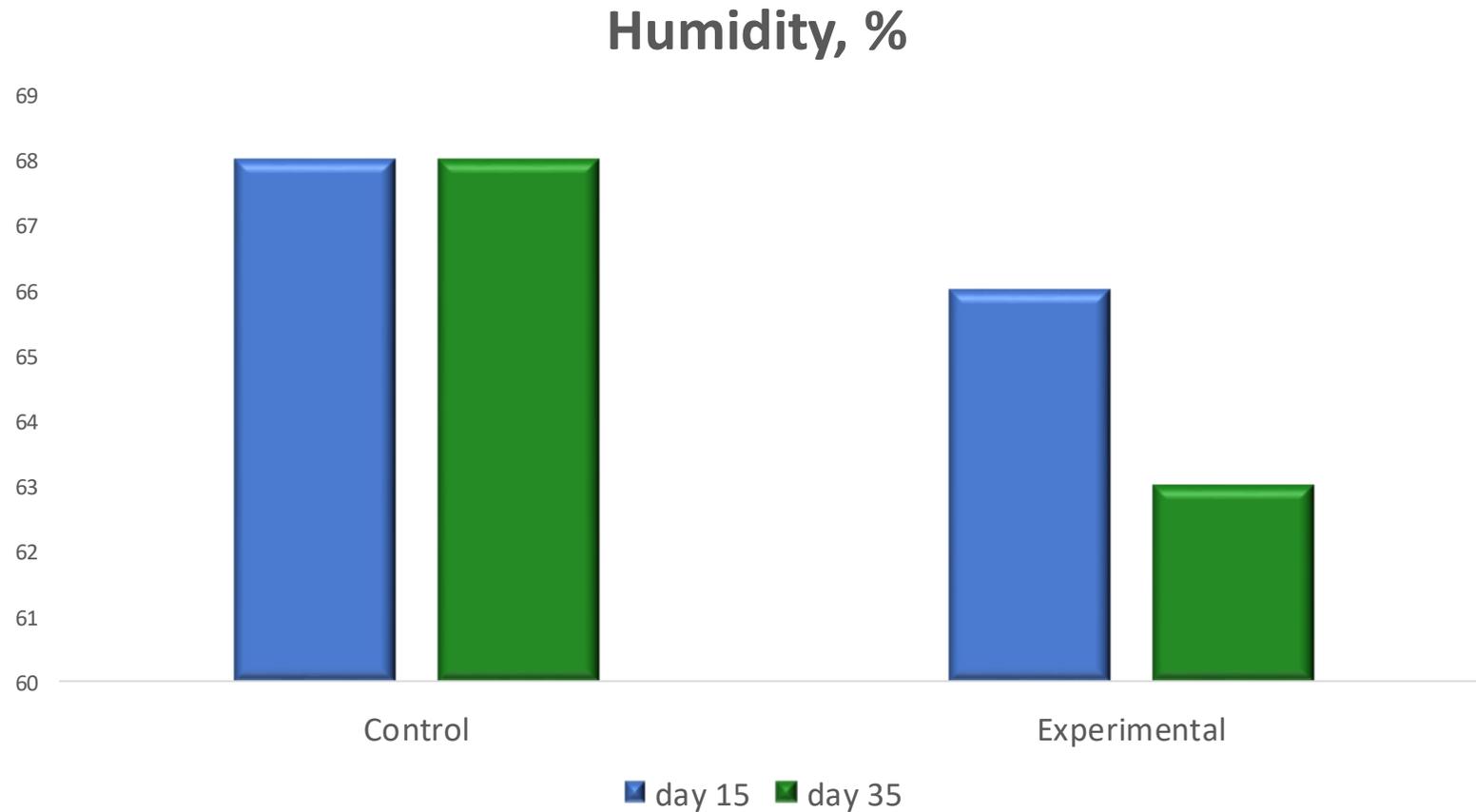
At the end of the trial, five chicks were selected from each group (5 birds × 2 groups = total of 10 birds) slaughtered in accordance with the recommendations of the eutanasia of experimental animals and carried out the following examinations:

1. Biochemical parameters of blood: Ca, Na, K, P, Fe, ALT, AST, ALP, glucose, lipidogram, total protein, albumen (10 samples from each group);
2. Development of internal organs;
3. Morphologic composition of the carcass. The carcasses are cut according to the recommendations of "Dissection of Poultry Carcasses";

Field – Scientific trial

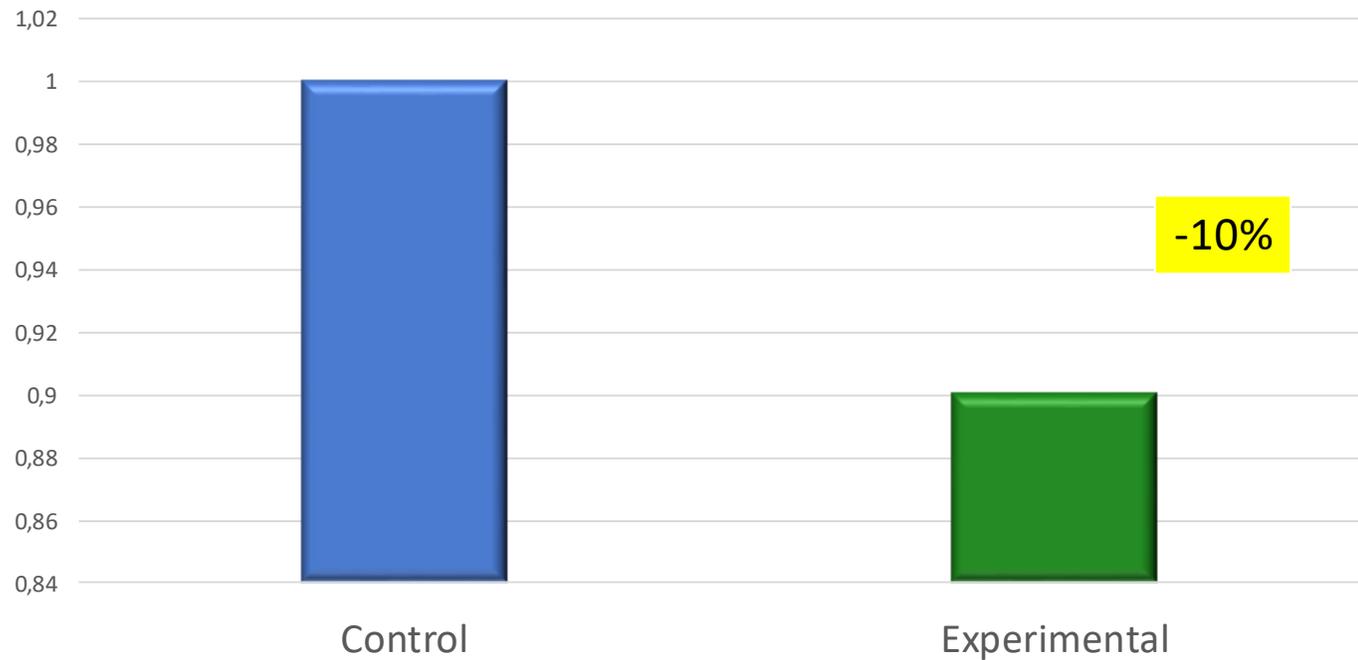


Field – Scientific trial



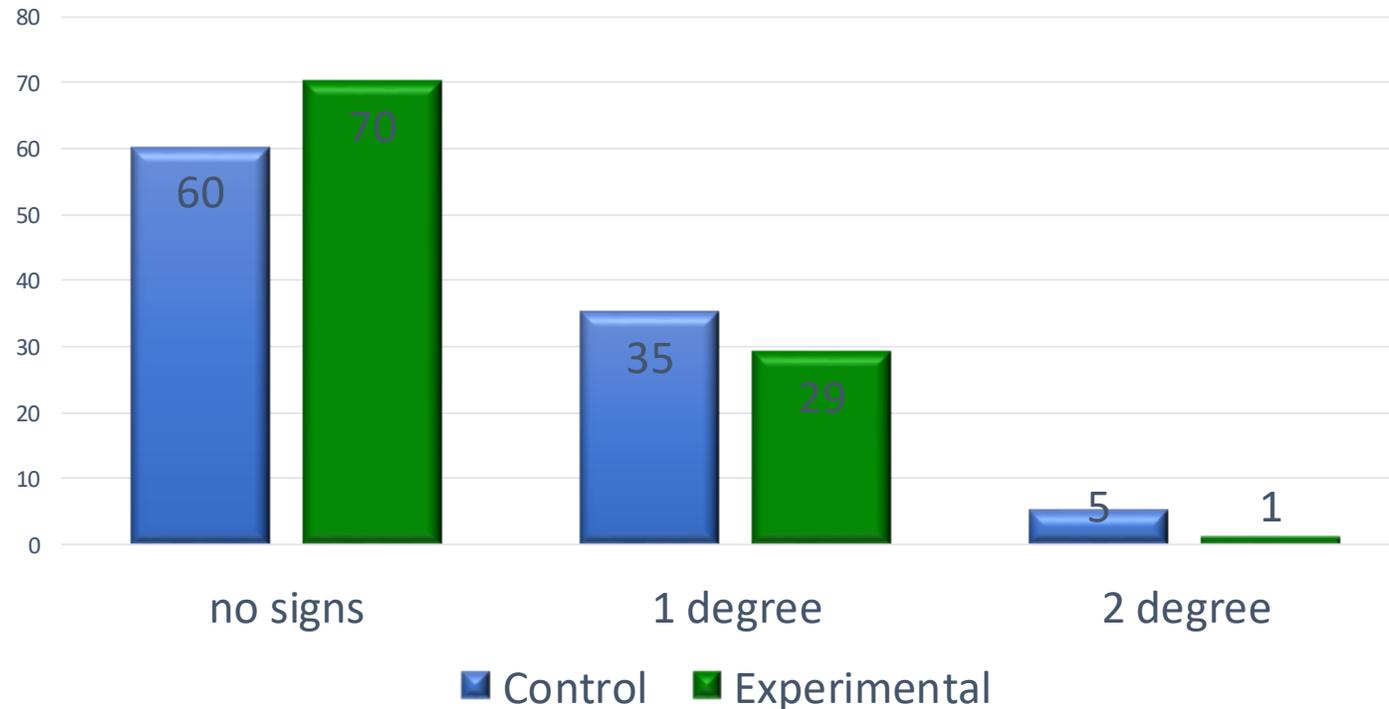
Field – Scientific trial

NH₃ concentration

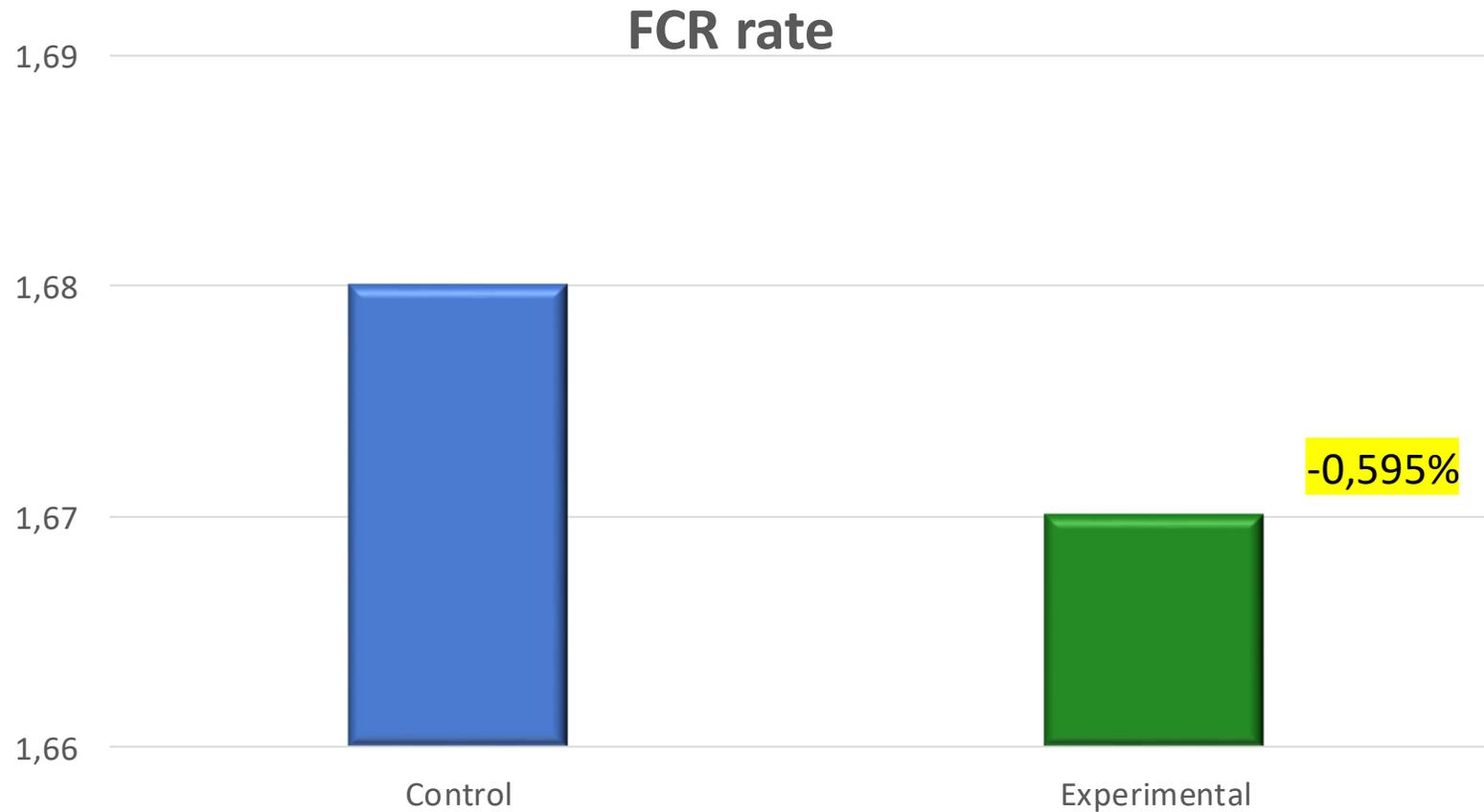


Field – Scientific trial

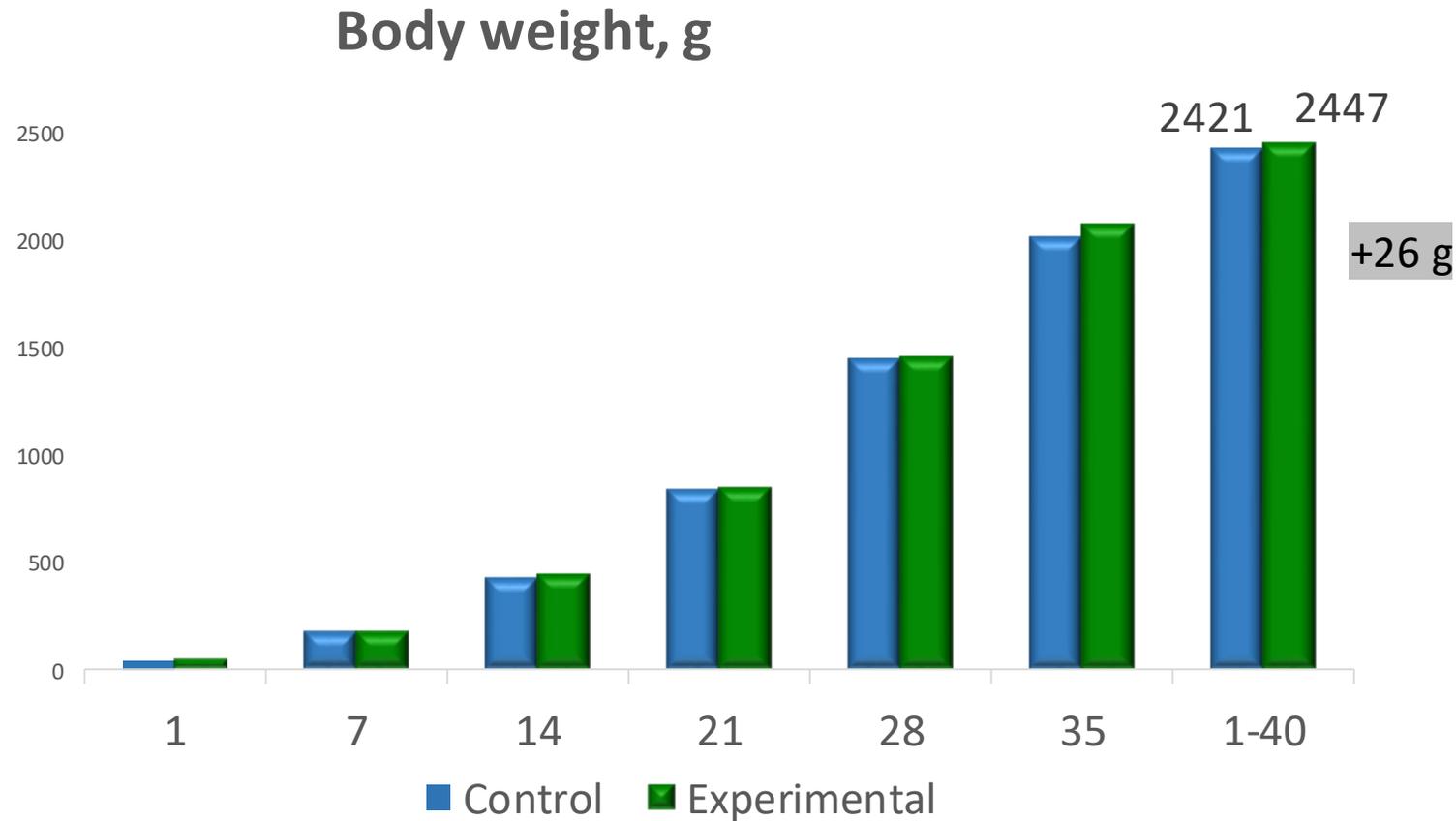
Pododermatitis on day 35, %



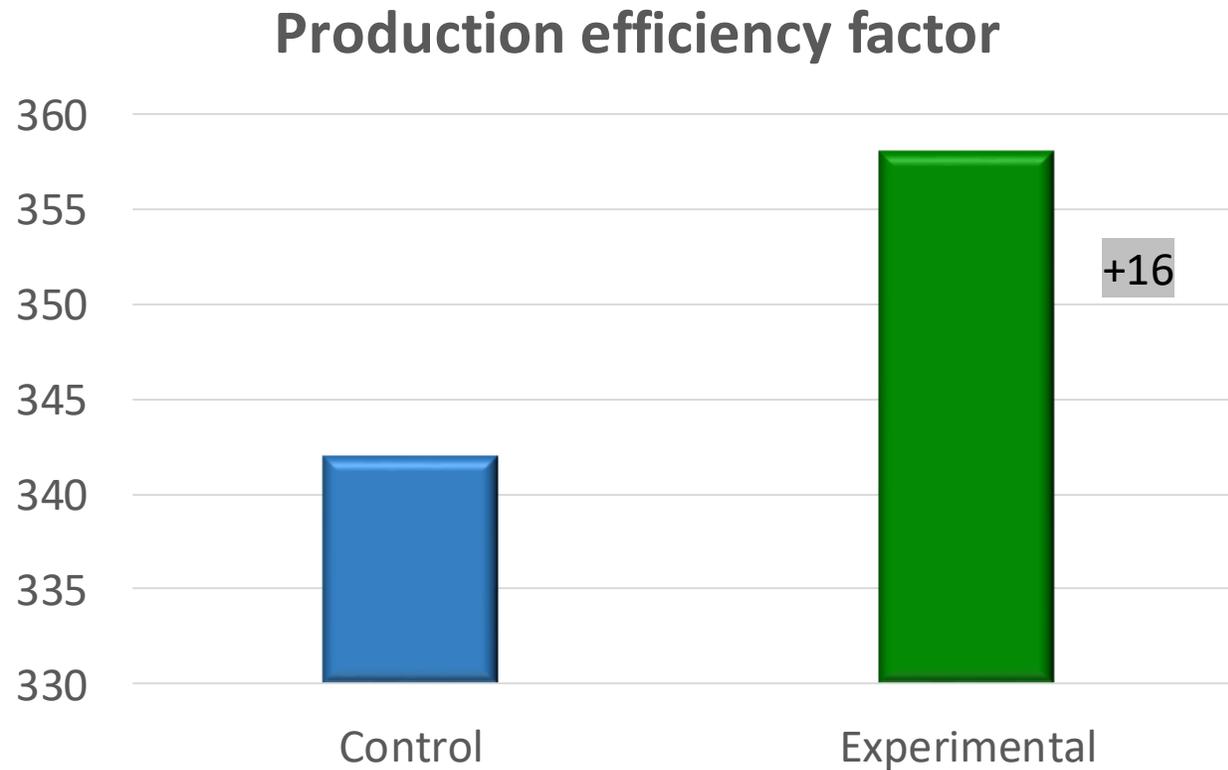
Field – Scientific trial



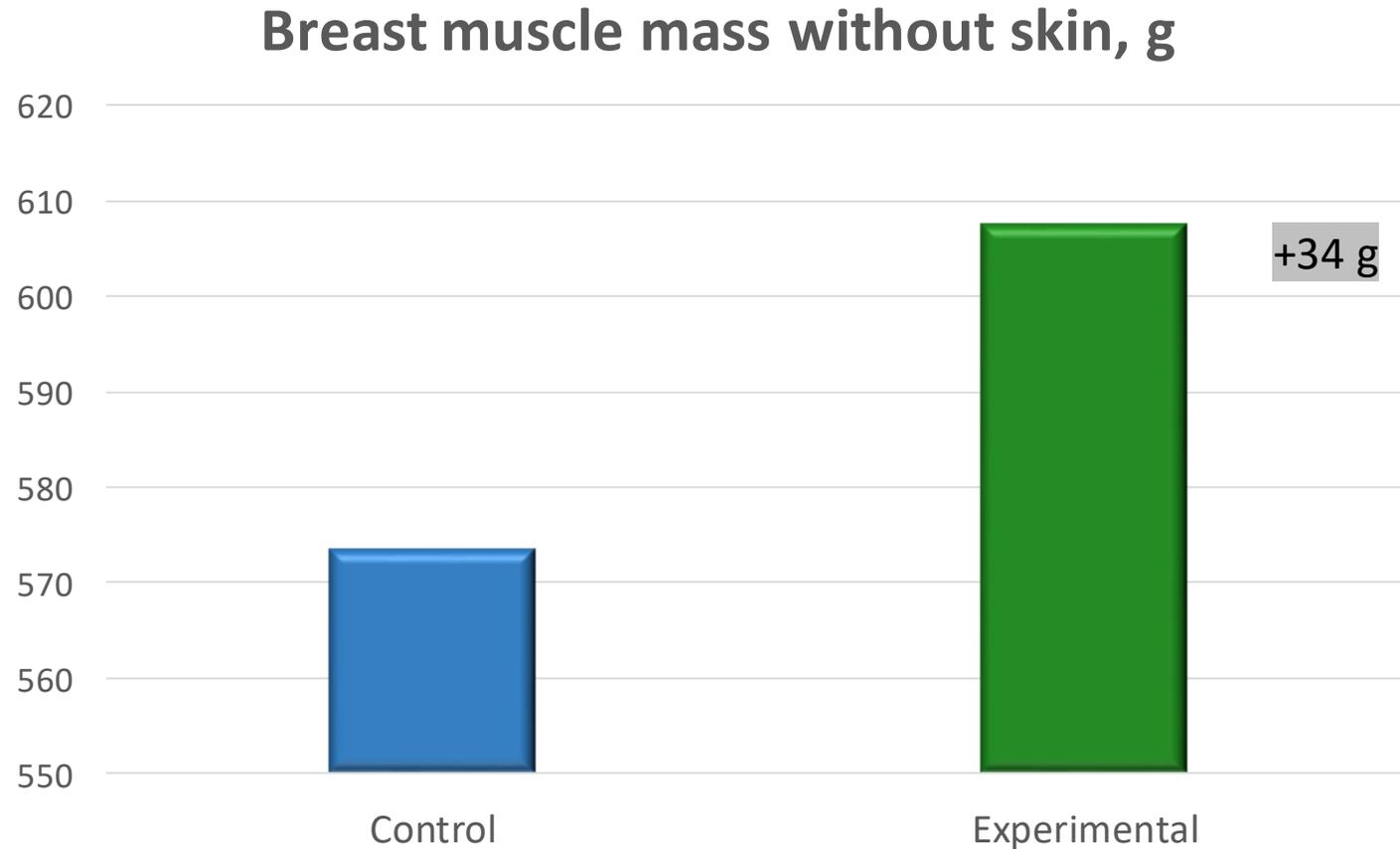
Field – Scientific trial



Field – Scientific trial

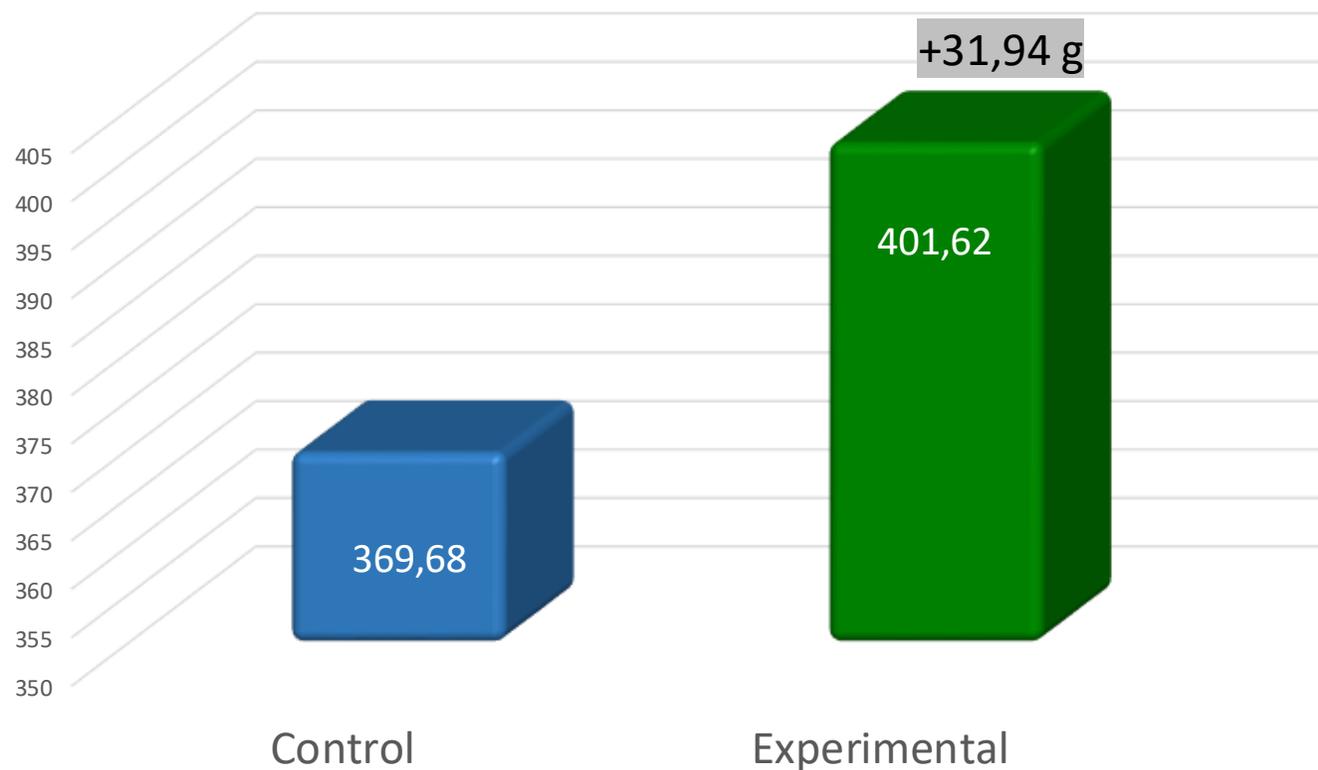


Field – Scientific trial



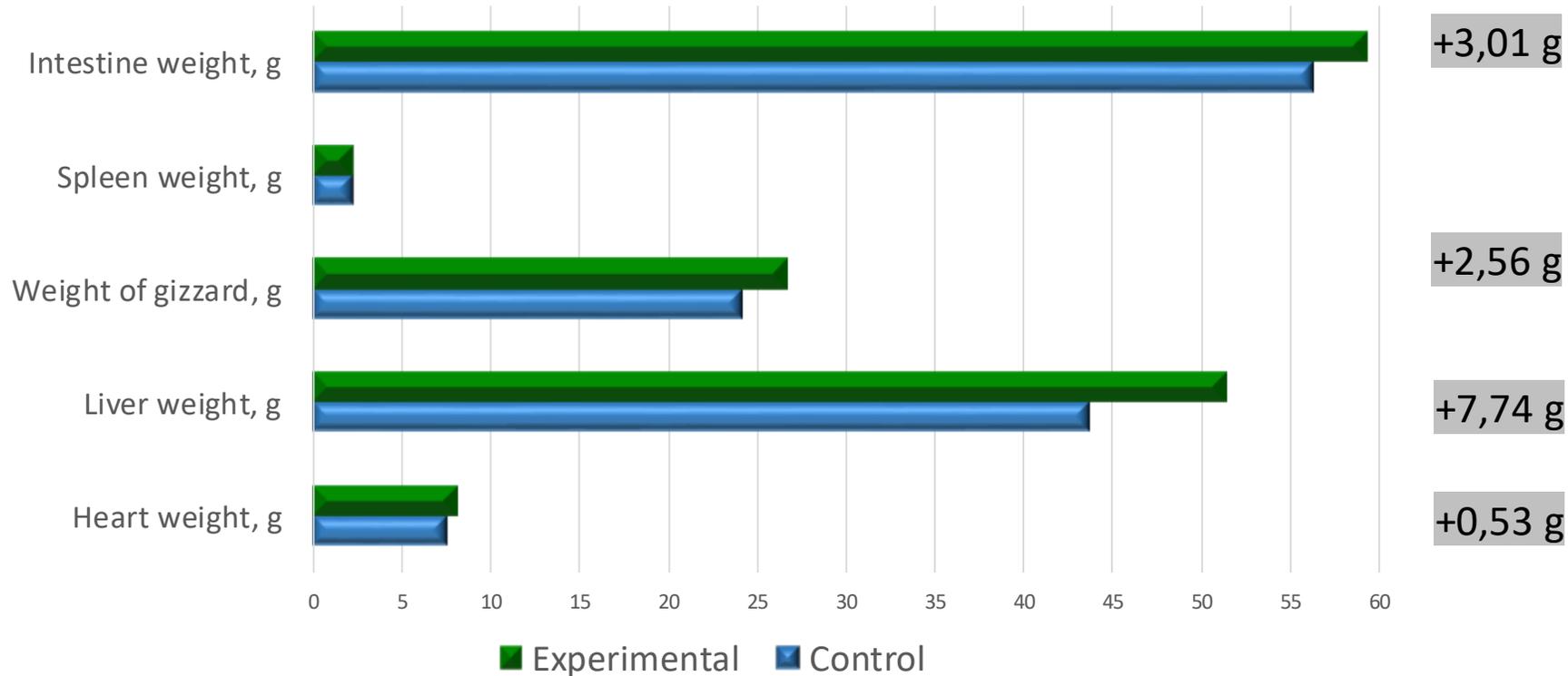
Field – Scientific trial

Leg muscle mass without skin and bones, g



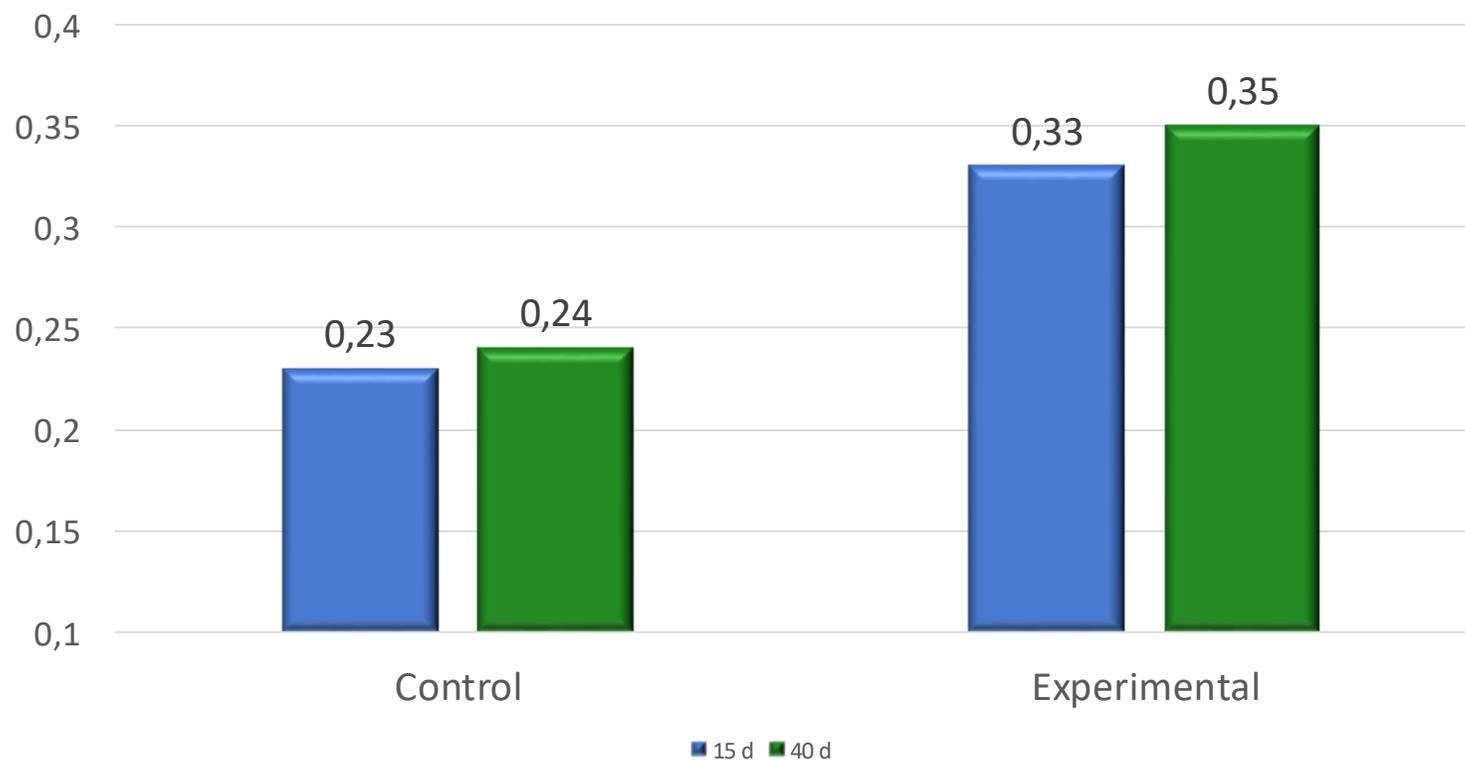
Field – Scientific trial

Development of intestine and visceral organs

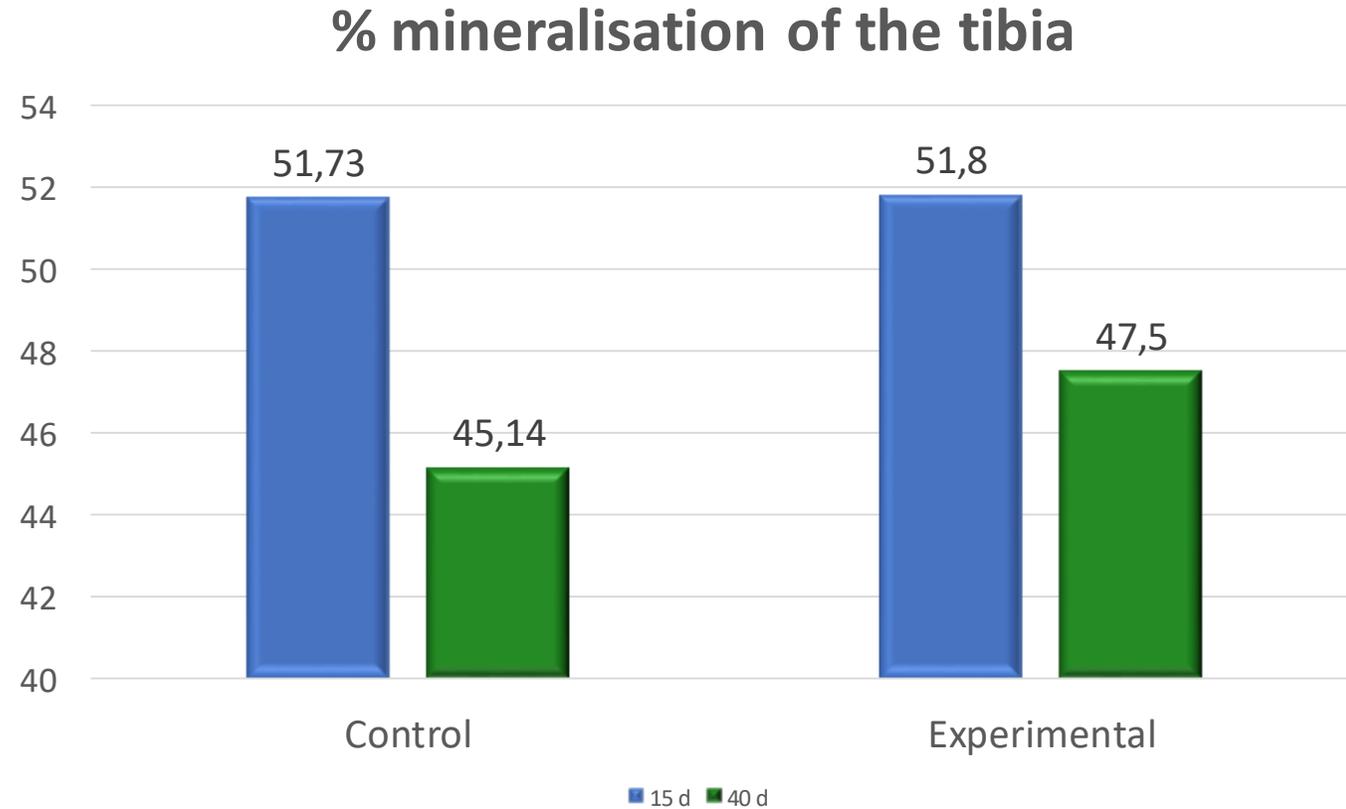


Field – Scientific trial

Strength of the tibia (kN)

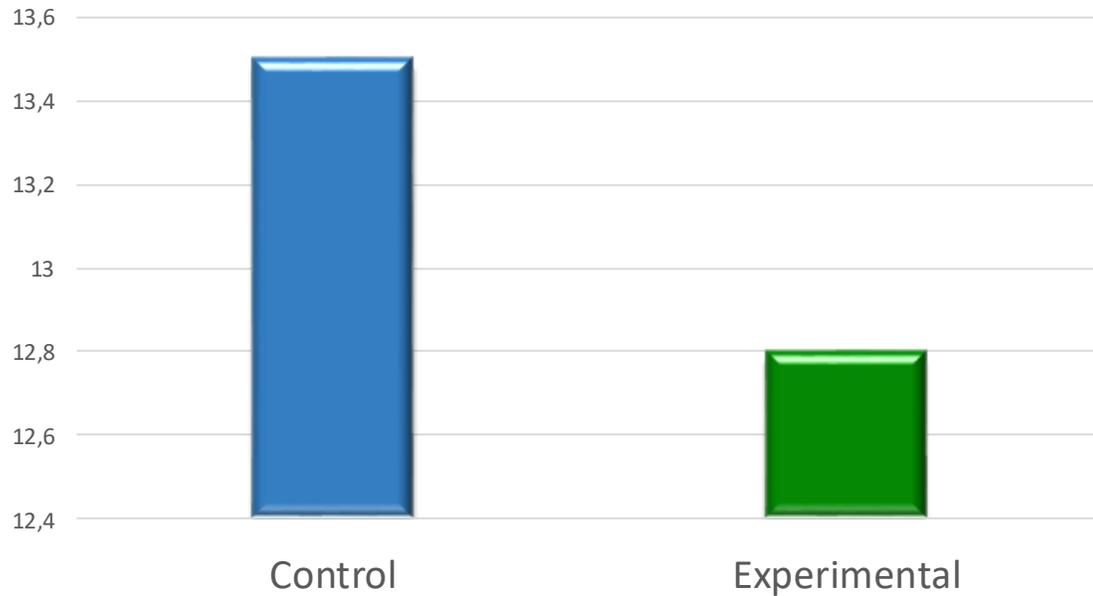


Field – Scientific trial

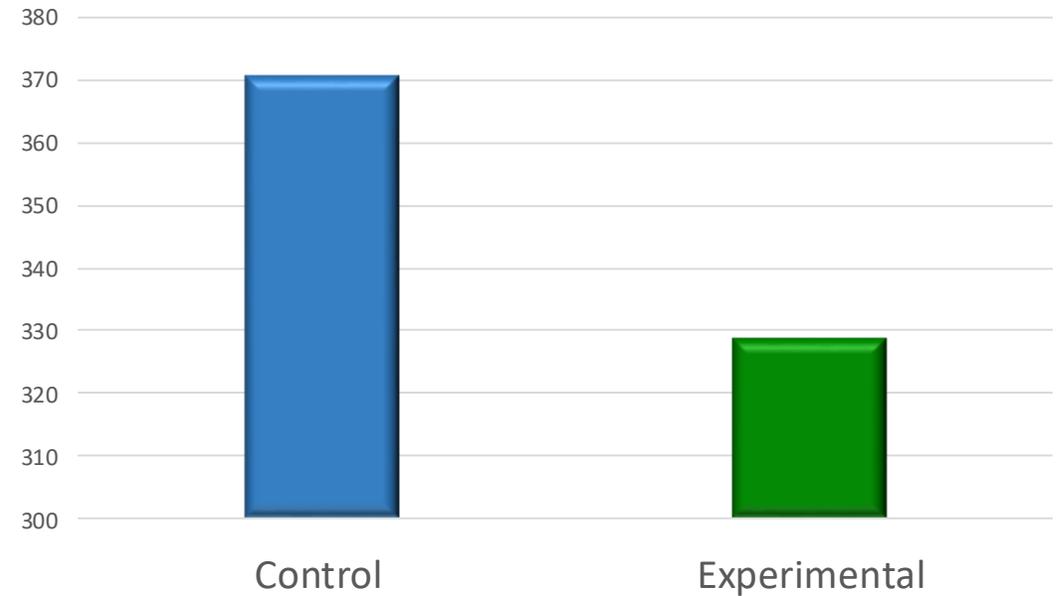


Field – Scientific trial

Liver enzyme in blood ALT, (U/l)



Liver enzyme in blood AST, (U/l)



Overall conclusion form the Field – Scientific trials in Lithuania (not final)

- Improves the hygienic situation in poultry houses creates more comfortable conditions for birds.
- Positively influences development and health of intestine and visceral organs.
- Influences on better transportation of necessary components from the digestive system to the body tissues and bones.
- Higher body weight gain with less feed. Better FCR.
- 1EUR equals to 3,5 EUR income



Successful testing of
Reasil[®] Technology in
poultry, cattle and pig
breeding

REASIL[®]
Technology





Life Force

www.lifeforce.pro

info@lifeforce.pro