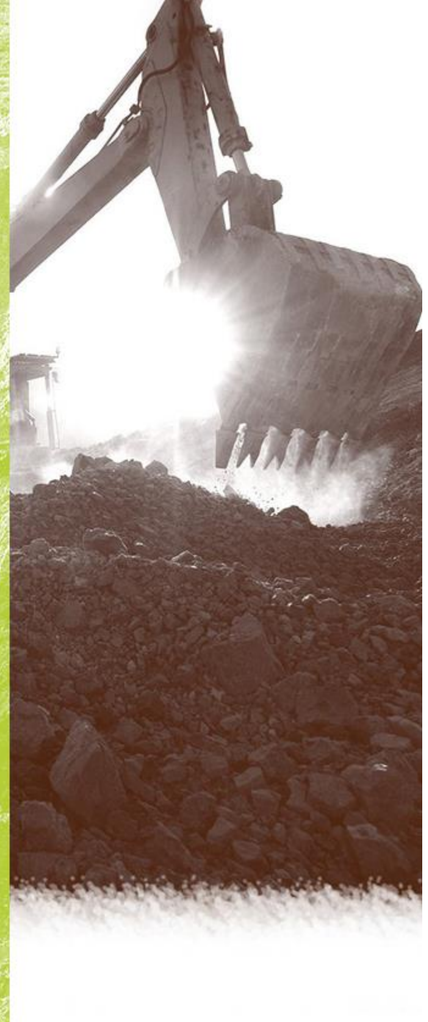

GEOHELLAS

ULTRAFED & SANFED PREMIUM PRODUCTS (ESSENTIAL OIL OF OREGANO)

01.01.2023

ULTRAFED®

NATURAL ALTERNATIVES FOR GROWTH PROMOTION | PREMIUM

STRONG ANTI TOX FORMULA

NATURAL PRODUCTS

1. Innovative nutritional solutions for productive animals
2. Full protection of intestinal mucosa from toxins and toxinogens
3. Antimicrobial and antiviral action
4. Reinforced auto-immune system
5. Reinforced digestive security
6. Advanced health and growth

ULTRAFED®: Special Natural Nutritional formulas based on Attapulgite, used for protection of intestinal mucosa of young animals from *E.Coli* infections, as alternative to antibiotic growth promoters.

ULTRAFED® is absorbing microbial enterotoxins (Enterotoxinogenic *E.Coli*), mycotoxins and decomposition products of proteins such as biogenic amines, cleaning the digestive system of the animal and offering a renewed and healthy microphlora, which improves feed efficiency and farm profitability.

Attapulgite is a Magnesium type aluminosilicate coming from the unique deposit in Europe and is receiving a special tribomechanical & delamination treatment by a unique process developed by Geohellas SA (so called dynamization), to enhance anti-diarrheal and toxinogen binding properties.

NATURAL PRODUCTS

NEW

New antitox formula with dynamic milling treatment to adsorb a wide range of toxins. New series of products, ULTRAFED Premium, with essential oils, for pigs and poultry, offering additional antibacterial, antifungal, antioxidant and immune system support.

ULTRAFED® PIGS

ULTRAFED PIGS

- Higher intestinal hygiene
- Reinforced digestive security
- Reduction of diarrheas
- Reduction of mortality in weaning ED
- Considerable reduction in consumption of medicines (1", 2"d weaning & post-weaning)
- Alternative to antibiotics in prevention of Colibacilosis
- Improved growth rate (DWG) and final body weight
- Better Feed valorization (FCR)
- High protection of sows from mycotoxins (Zearalenone etc)
- Considerable economic benefit of the farm

ULTRAFED® LAYERS

ULTRAFED® BROILERS

ULTRAFED LAYERS - BROILERS

- Higher intestinal hygiene
- Reduction of diarrheas (wet droppings)
- Improved status of bedding material
- Reduction of breast blisters and hock burns
- Improve meat quality (reduction of hematomas)
- Reduction of mortality
- Better Feed valorization (FCR)
- Considerable economic benefit of the farm (improved EPEF)
- Improved egg laying percentage

ULTRAFED® DAIRY

ULTRAFED BROILERS

- Higher intestinal hygiene
- Reduction of diarrheas in new born animals
- Reduction of early mortality caused by *E.Coli*
- Stabilization of PH in stomach and intestine
- High protection from Aflatoxin B1 with consequences in reduction of Aflatoxin M1 in milk
- High protection from mycotoxins (Zearalenone) in pregnant animals
- Improved milk characteristics
- Considerable economic benefit of the farm

Produced in EU by GEOHELLAS S.A.

8A Pentelis Str., 175 64 Athens, Greece
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www.geohellas.com

GEOHELLAS
Technical clays. Natural solutions.

GEOHELLAS

Essential oils - Antimicrobial effect *in vitro*

- Bactericidal/Bacteriostatic effect of Essential oils

Classification	Chemical group	Ingredient	Essential oil
1	Phenols	Thymol, eugenol, carvacrol, gaiacol	Thyme, oregano, clove, cinnamon leaves
2	Aldehyde	cinnamaldehyde	Inner bark of cinnamon tree
3	Monoterpénol C10	1-terpinène-4-ol	Tea tree
4	Aldehydes	Geranial, citronellal	Lemon grass
5	Cetones	Verbenone, menthone, carvone	Rosemary, aniseed, mint
6	Ether	Estragol, anethol	Basil, aniseed, star anise
7	Oxydes	Eucalyptol	Eucalyptus
8	Terpenes	Pinenes	Pines, firs

Knobloch et al., 1989; Franchomme et al., 1990; Dogna, 1990; Inouye et al., 2001; Friedman et al., 2002; Hernander-Ochoa, 2005

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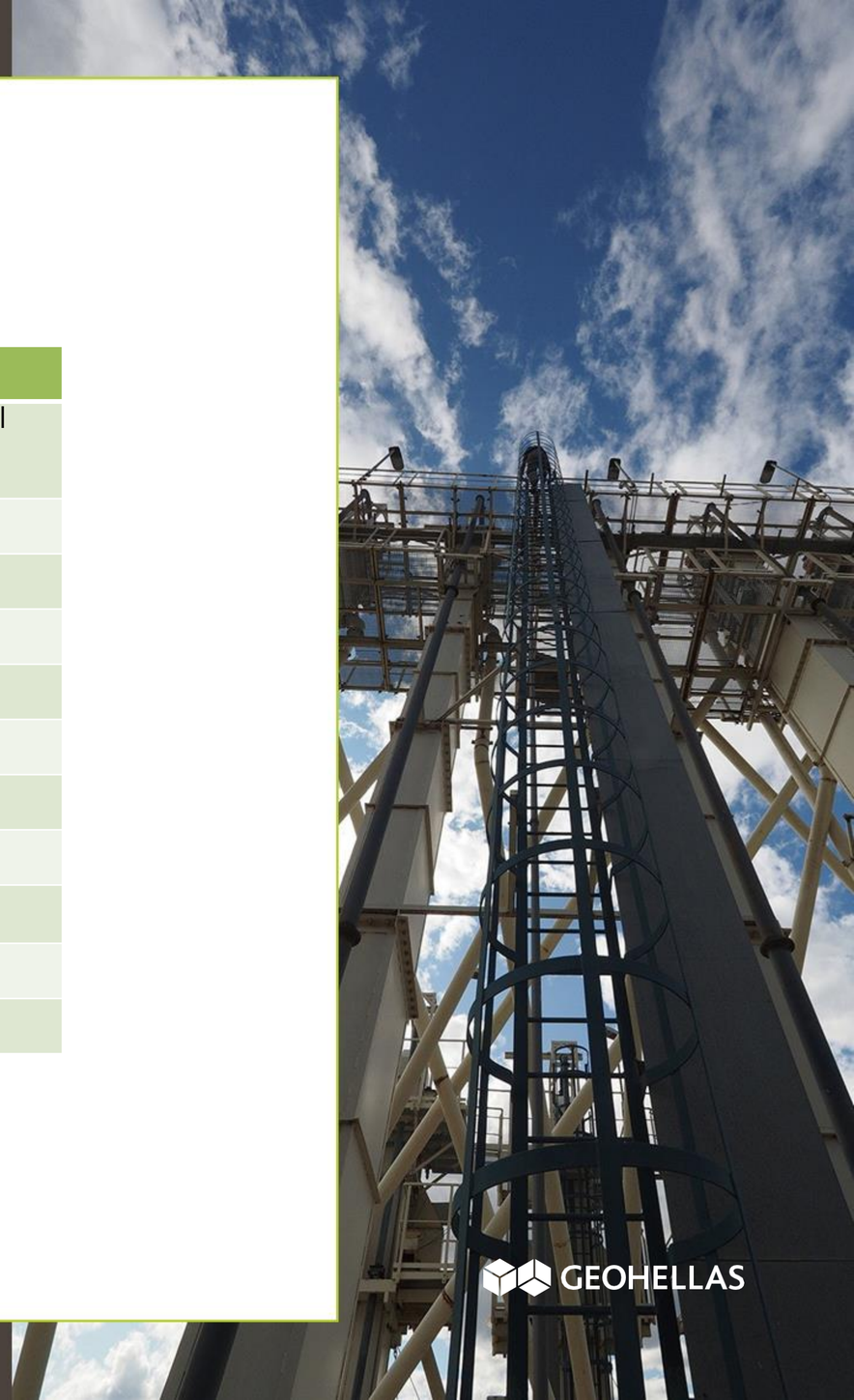
Biologically active essential oils

Table: Types and number of biologically active compounds found in different plant species (adapted from Mathe, 2009)

	Effec				
	Anti-oxidative	Sedative	Anti-depressant	Anti-viral	Anti-microbial
Bay	3	5	-	5	5
Cassia	3	-	-	3	3
Cayenne	9	7	7	6	8
Cumin	5	6	-	7	11
Garlic	9	5	5	5	13
Ginger	6	11	5	6	17
Oregano	14	-	-	11	19
Rosemary	12	6	-	10	19
Sage	7	-	-	-	6
Thyme	4	-	3	3	5

Antioxidative substances can delay oxidation of feed ingredients (e.g. fat, oils) hence preventing degradation and increasing shelf life.



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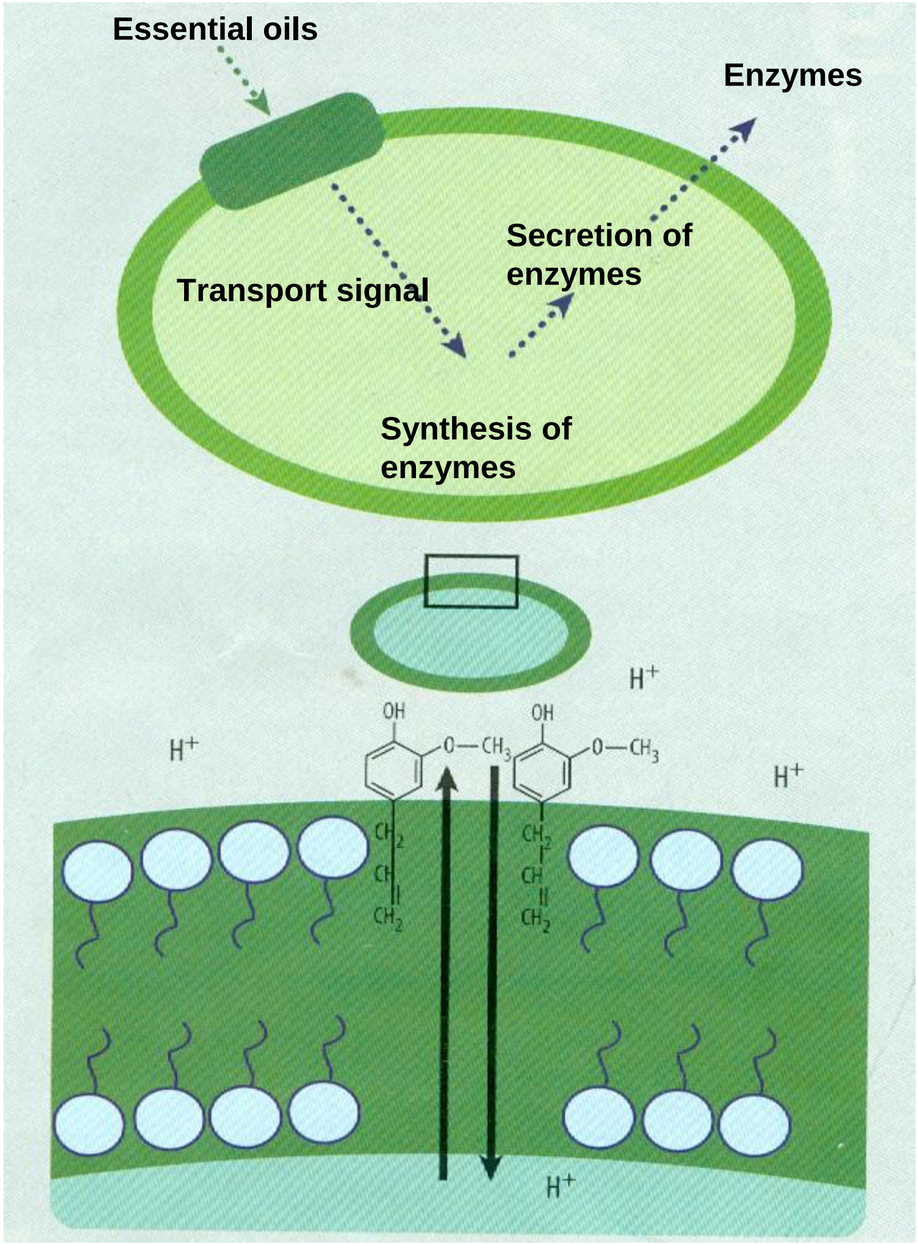
Synergy of essential oils with organic acids:
Essential oils increase the permeability of the bacterial cell membrane leaving the organic acids to penetrate and destroy it. They reduce viral loads (PRRS)

Synergy of Organic acids and prebiotics:
-Reduce synergistically percentage of diarrhea

-Are generating free organic acids, medium chain fatty acids, which are bactericidal

-Enhance cellular immunity



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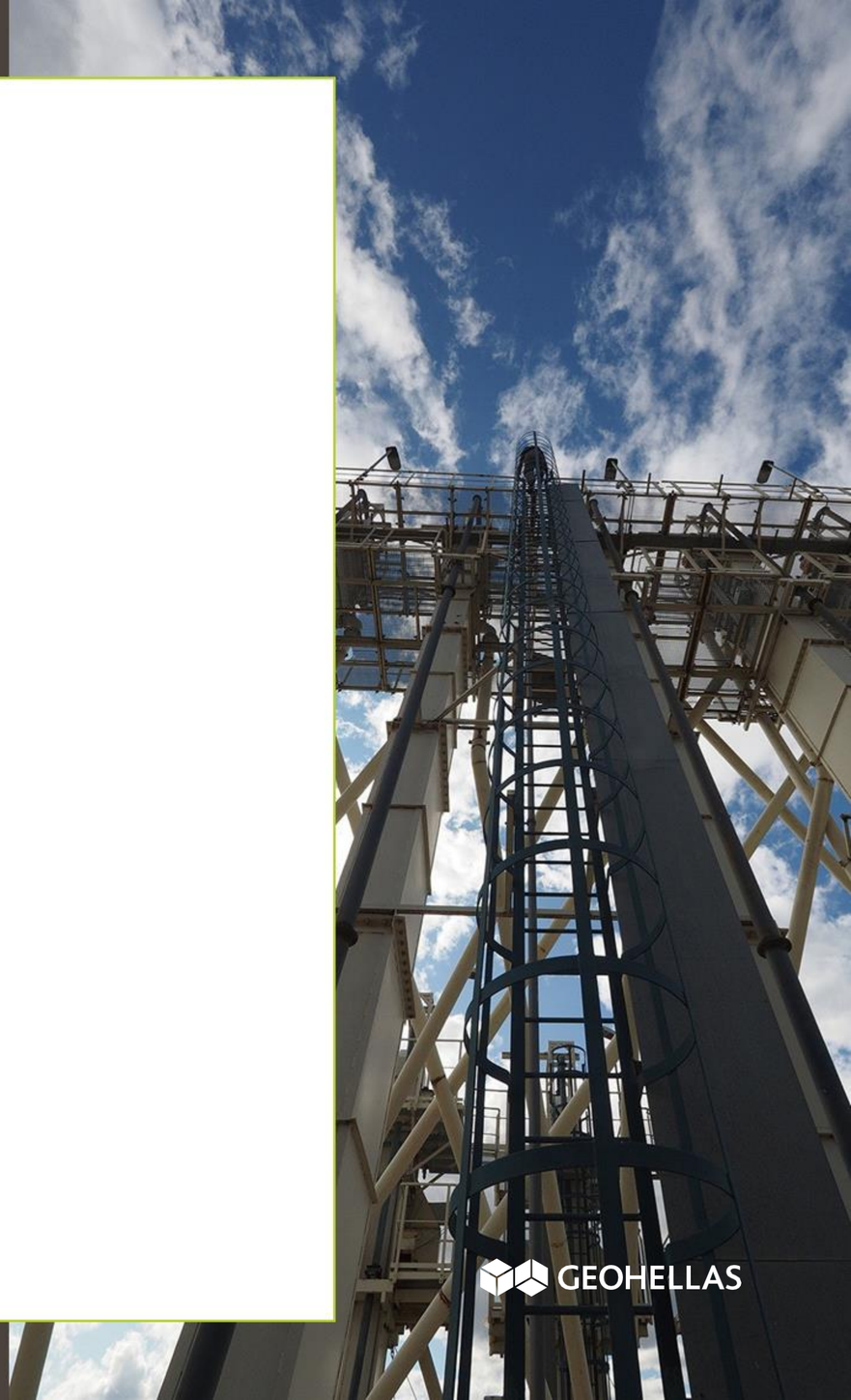
T.1 Effect of the use of essential oils and antibiotic on performance of weaned pigs

Item		PC	NC	EOD	SEM	p value
Phase 1 (d 0 to 7)						
	Weight gain (g/d)	378	354	416	28	0,33
	Feed intake (g/d)	478	473	502	26	0,71
	Feed conversion	1,3	1,3	1,24	0,08	0,59
Phase 2 (d 8 to 35)						
	Weight gain (g/d)	539	465	513	15	<0,01
	Feed intake (g/d)	937	860	861	26	0,07
	Feed conversion	1,73	1,87	1,69	0,07	0,18
Overall (d 0 to 35)						
	Weight gain (g/d)	505	442	393	15	0,02
	Feed intake (g/d)	846	783	789	24	0,13
	Feed conversion	1,67	1,79	1,62	0,06	0,20
	Fecal consistency	1,22	1,53	1,30	0,06	0,02

Literature trials- **compare control & antibiotic (Li. et al., 2012)**

Pc= positive control
NC= Negative control
Eod= feed with essential oils
Sem = significant difference

Improved FCR ! Essential oils interesting substitute of antibiotics



T.2 Effect of oregano oil on: Feed intake - Daily Weight Gain - F.C.R.

Table 1. Effect of oreganum essential oil[1] on performance of piglets from 1-21 days after weaning.

Parameter	Negative control	500 ppm oregano oil[1]
Feed intake (g/d)	466	496
Weight gain (g/d)	305 [a]	360 [b]
Feed/gain	1.53 [a]	1.38 [b]

[a,b] = $p<0.05$

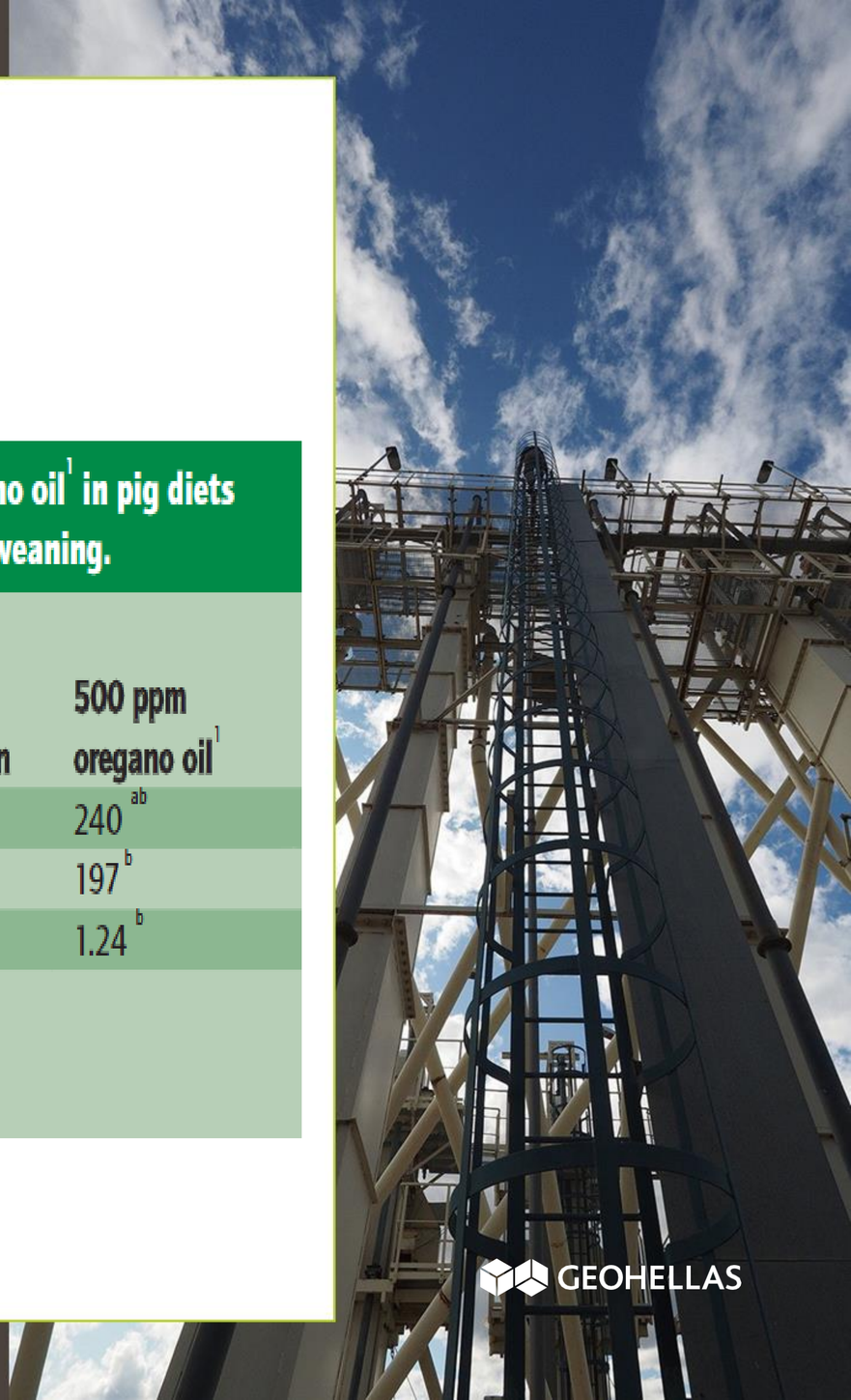
[1] Ropadiar® *Source: Günter and Bossow, 1998*

Table 3. Effect of avilamycin and oregano oil[1] in pig diets during the first 14 days after weaning.

Parameter	Negative control	40 ppm avilamycin	500 ppm oregano oil[1]
Feed intake (g/d)	230 [a]	250 [b]	240 [ab]
Weight gain (g/d)	169 [a]	209 [b]	197 [b]
Feed/gain	1.41 [a]	1.23 [b]	1.24 [b]

[a,b] = $p<0.05$

[1] Ropadiar® *Source: Van Krimpen and Binnendijk, 2001*



GEOHELLAS

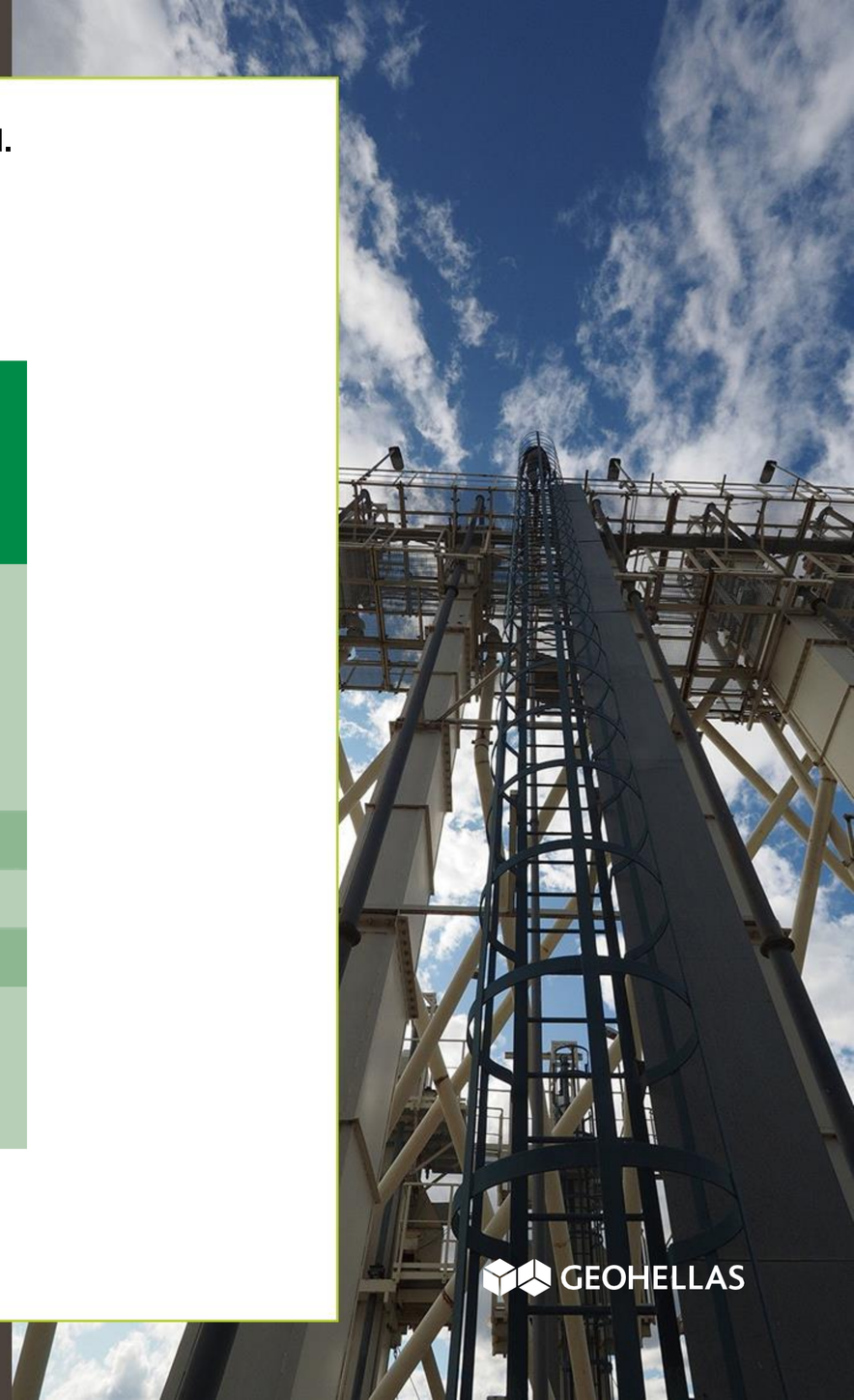
T.3 Effect of oregano oil in: Feed intake - Daily Weight Gain - F.C.R. versus colistin and organic acid.

Table 4. Effect of colistin, organic acid mix and organic acid mix plus oregano oil[1] on performance of weaned piglets from 21 to 40 days of age.

Parameter	Negative control	100 ppm colistin	600 ppm organic acid	Organic acid +1000 ppm oregano oil[1]
Feed intake (g/d)	251 [ab]	244 [a]	245 [a]	264 [b]
Weight gain (g/d)	169 [a]	174 [a]	170 [a]	192 [b]
Feed/gain	1.49 [a]	1.41 [ab]	1.45 [ab]	1.38 [b]

[a,b] = $p<0.05$

[1] Ropadiar® *Source: Pineiro, 2002*



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T.4 Results of using oregano oil in fattening pigs.

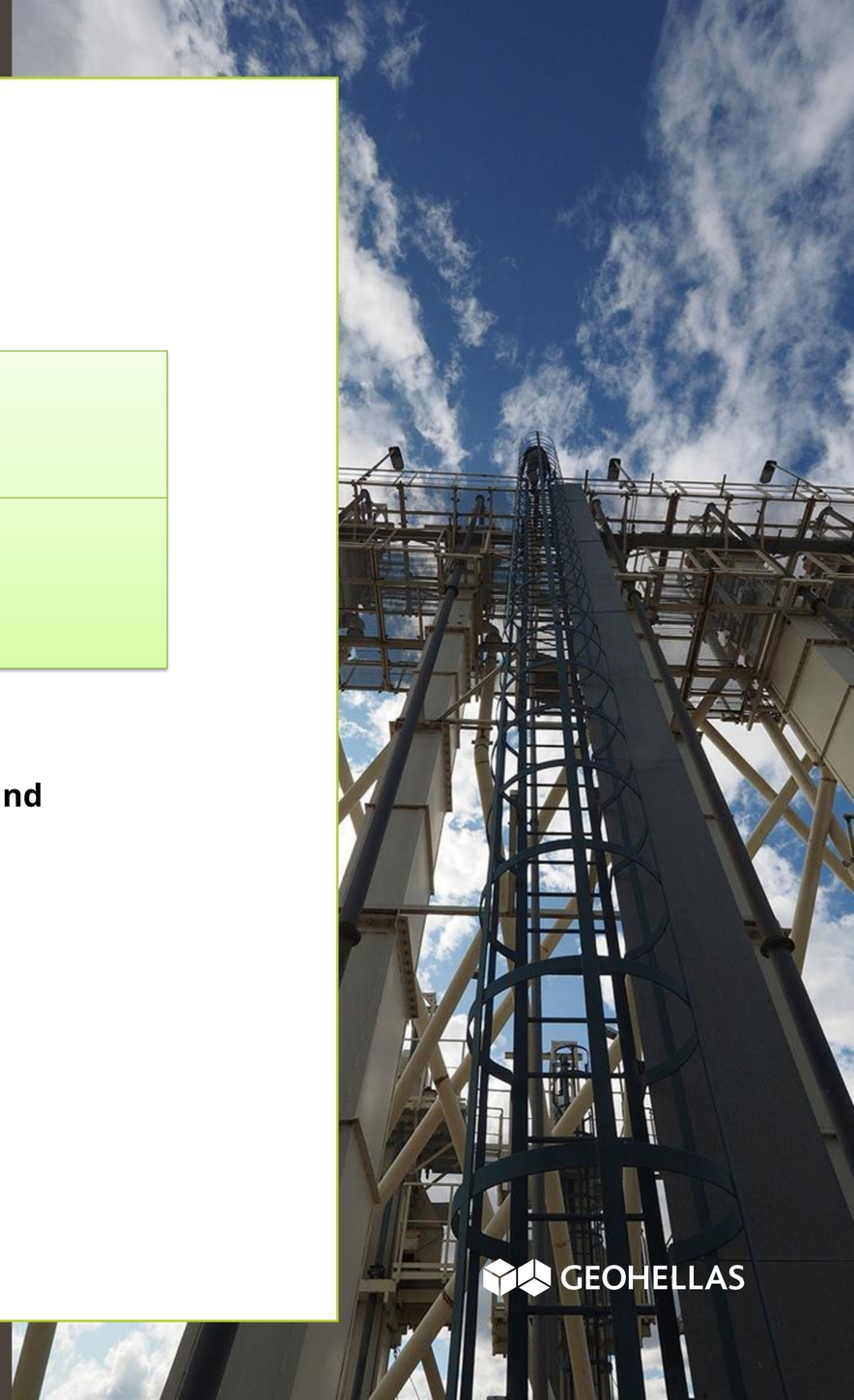
Table 2: Fattening pigs production performance parameters

	Oregano oil	Control	Difference %
% Mortality	0.37	4.88	-5
Growing period (days)	106.8	102.1	5
Initial average pig weight (kg)	23.82	23.41	2
Final average pig weight (kg)	110.1	102.7	7
Total av. weight gain per pig (kg)	86.3	79.3	9
Average daily weight gain (g)	808	776	4
FCR	2.5	2.57	-3

T.5 Effect of essential oils on growth of lactobacillus (Iog 10 U≠c/g substance)

	Control	Essential oil
Lactobacillus spp.	5.27	6.34

Synergistic antibacterial action of plant extracts with probiotics (Lactobacillus, Bacillus and Pediococcus) in E. Coli and Clostridium spp.



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T.6 Immunostimulation

Using oregano oil during pregnancy and control of antibodies in the colostrum

	Control	Oregano oil
Ig G in colostrum (mg/ml)	37,68	50,79

University of Bristol, 2012

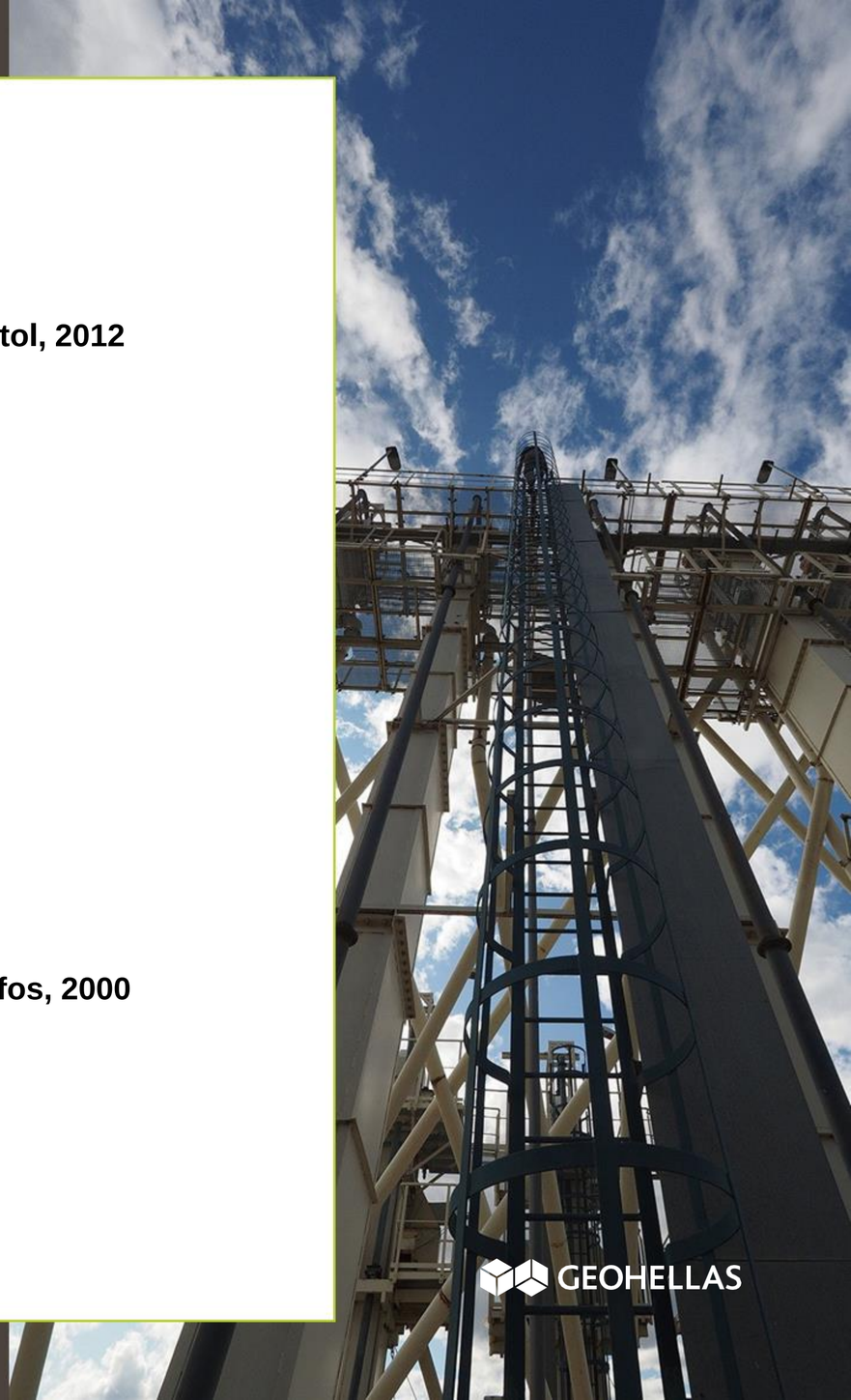
Flavonoids → enhance the phagocytic capacity of macrophages

Poly Uric acid → stimulates the thymic cells, activates the production of T-cells

T.7 In vitro inhibition of pathogens from oregano oil

Organization	Activity	MIC (ppm)
Staph. aureus	+++	80-160
P. multocida	++++	160-330
E.coli	++++	160-330
Salmonella spp.	++++	160-330

Tsinas and Skoufos, 2000



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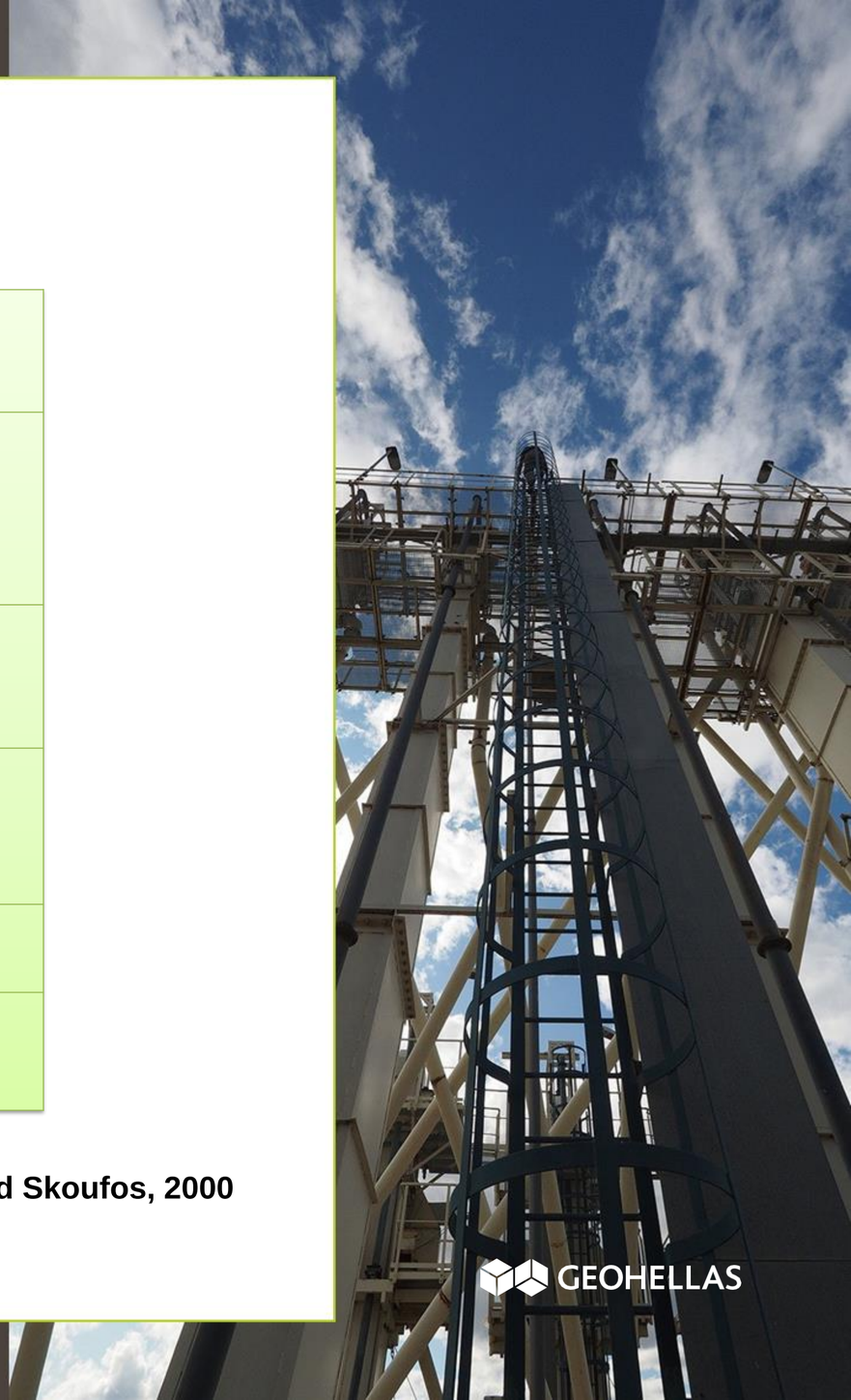
T.8 Effect of oregano oil in diarrheal syndromes after weaning (1-21 days)

Parameter	Control	250g/t	500g/t
Daily Weight Gain (g/day)	181	198	222
Daily Feed Intake (g/day.)	327	330	364
F.C.R.	1.80	1.67	1.64
Diarreal Score	7.08	4.33	3.10
Mortality (%)	6.1	2.7	0.4

Tsinas and Skoufos, 2000



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T.9 Use of Ultrafed Pigs Premium in pig farm with 400 sows in Larissa - Greece.

- The experiment began in growing phase (70 days).
- Done in two rooms of 84 and 82 animals each.
- Each room had 4 boxes which were divided into control (2 boxes from left) and in animals that consumed Ultrafed Pigs Premium (2 boxes from the right).
- Feed consumption and the final weights until slaughter, were measured.
- Pigs raised in exactly the same conditions and temperatures.

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The results of using Ultrafed Pigs Premium (F.C.R.)

1st room

ULTRAFED PIGS PREMIUM	CONTROL
F.C.R	F.C.R
2,32	2,65

2nd room

ULTRAFED PIGS PREMIUM	CONTROL
F.C.R	F.C.R
2,49	2,54

The results of using Ultrafed Pigs Premium (Weight Gain)

1st room

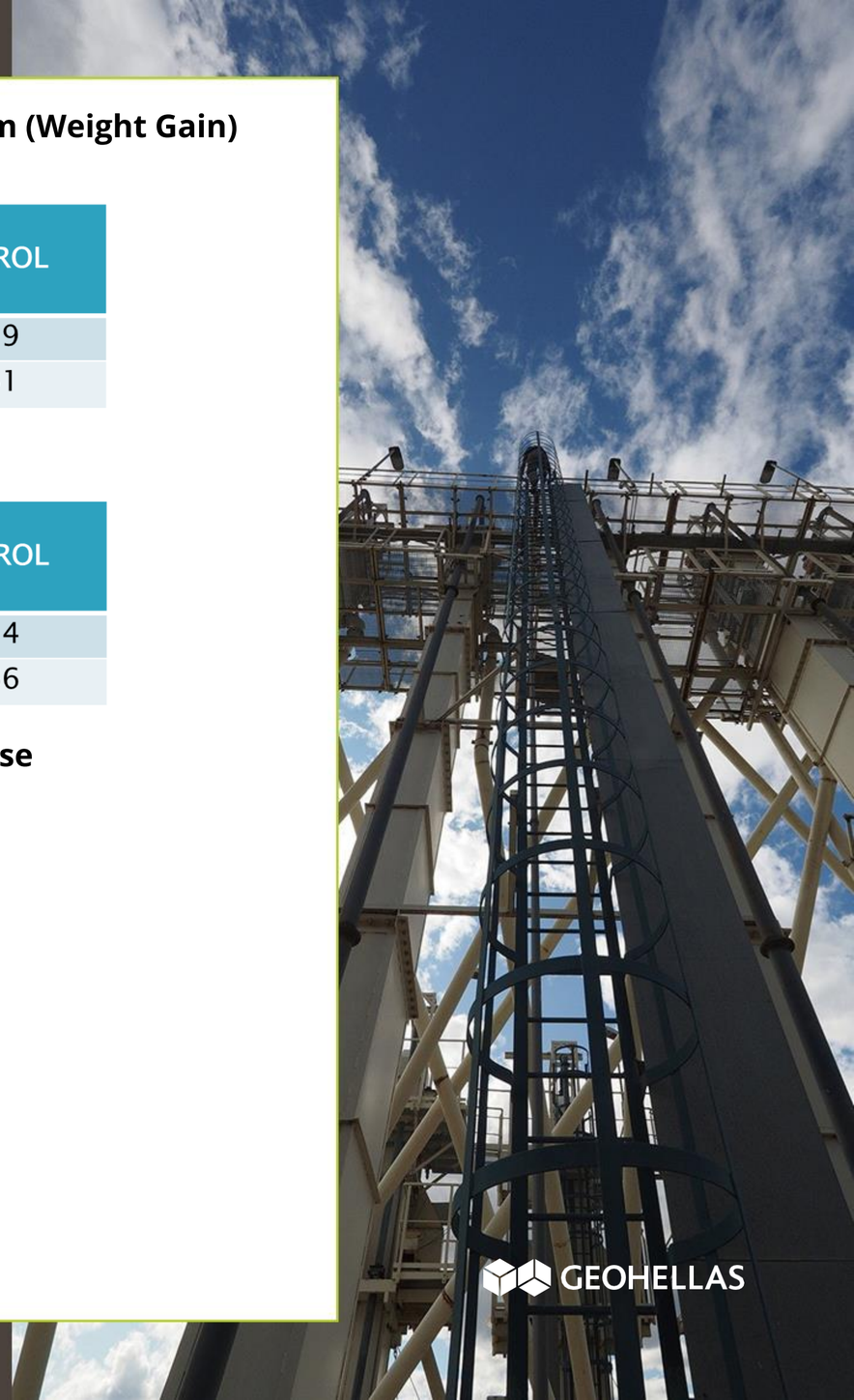
	ULTRAFED PIGS PREMIUM	CONTROL
INITIAL WEIGHT Avg.	38,13	38,29
FINAL WEIGHT Avg.	101,19	96,61

2nd room

	ULTRAFED PIGS PREMIUM	CONTROL
INITIAL WEIGHT Avg.	36,25	37,14
FINAL WEIGHT Avg.	99,11	96,66

Cost benefit analysis with use of Ultrafed Pigs Premium in growing - fattening phase

	COST BENEFITS
No. Sows	400
Total No. of produced pigs/year	10.850
Final Weight difference	+4,04 kg → **52.600 €**
F.C.R. difference	2,59 → 2,41 **25.100 €**
Total	77.700 €
Annual quantity of ULTRAFED PIGS PREMIUM	6 MT



T. 10 Study of commercial product based on attapulgite (Ultrafed®)

EAAP 2014
Copenhagen, Denmark
25 – 29 August 2014
65th annual meeting of the European Federation of Animal Science

TEI of Epirus
School of Agriculture Technology
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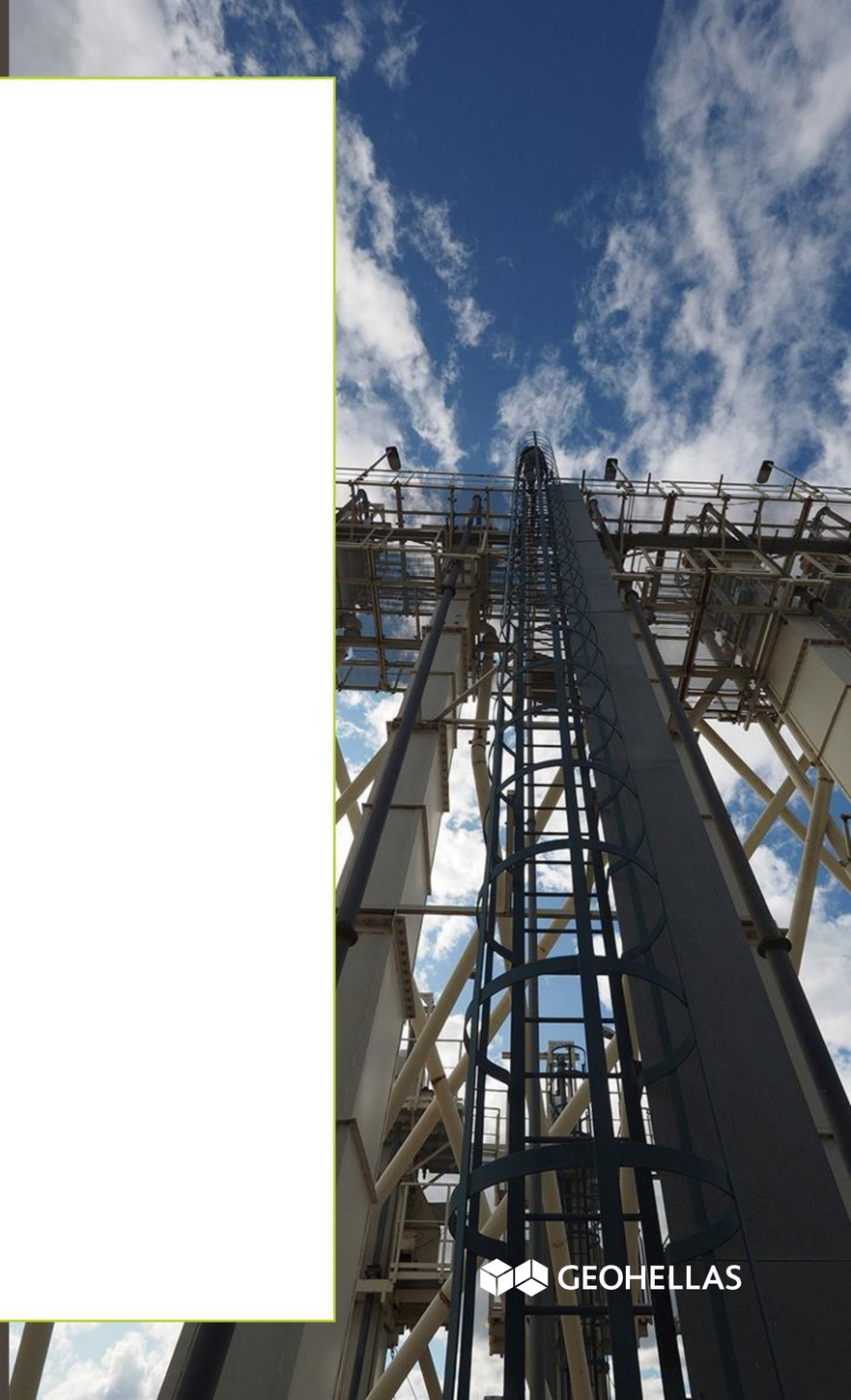
A STUDY OF A COMMERCIAL PRODUCT BASED ON ATTAPULGITE (ULTRAFED®) FOR THE DETERMINATION OF ITS PROTECTIVE ACTION IN VITRO, AGAINST E. COLI AND CL. PERFRINGENS TOXIGENIC STRAINS IN THE PIG

Skoufos I[1]., Verginadis I[2]., Simos I[2]., Tzora A1., Mentis A[3]., Tsinas A[1]., Magklaras G[1]., Theofilou N[4]., Karkabounas Sp[2].

1. Department of Agriculture Technology, Division of Animal Production, TEI of Epirus, Arta, Greece
2. School of Medicine, University of Ioannina, Greece
3. Hellenic Institute Pasteur, Athens, Greece
4. Geohellas S.A., Athens, Greece

Results

In increased concentrations of *E. coli and Cl. perfringens* (10/ml to 10^6/ml), attapulgite appears to have a protective action in comparison to the control group (incubate the IPEC-J2 cells and *E. coli* or *Cl. perfringens*), increasing by 21% the number of surviving cells in the presence of *E.coli* (10/ml) and 13% at the highest concentration (10^6/ml). Similarly, the number of surviving cells in the presence of *Cl. perfringens* increased 13% at the lowest concentration (10/ml) and 9% at the highest (10^6/ml).



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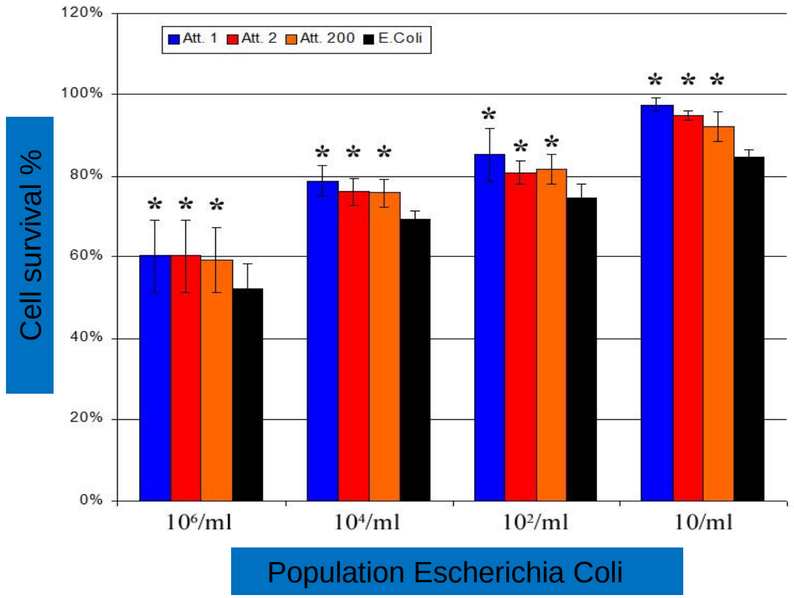
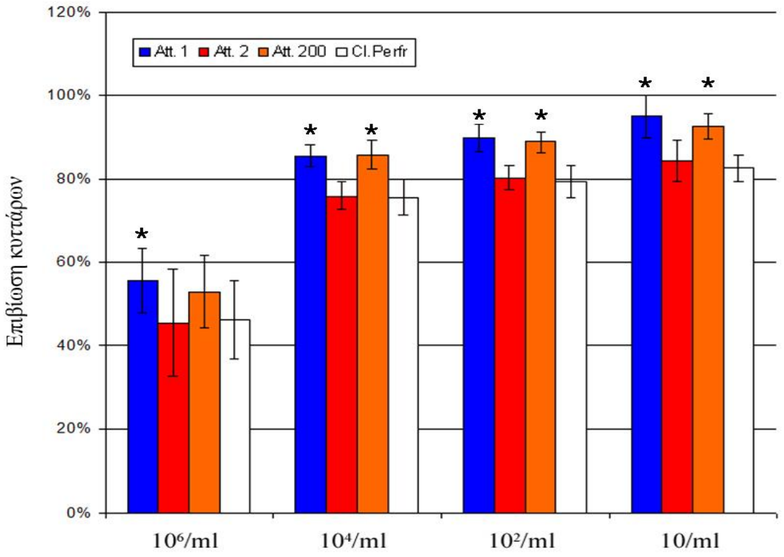
Escherichia Coli



*** Statistical significant difference versus control with E. Coli, p<0.05**

Escherichia coli				
	10/ml	10^2/ml	10^4/ml	10^6/ml
Att. 1	21%	17%	15%	13%
Att. 2	17%	10%	11%	13%
Att. 200	12%	11%	10%	12%

Clostridium Perfrigens



*** Statistical significant difference versus control with Clostridium Perfrigens, p<0.05**

Clostridium perfrigens				
	10/ml	10^2/ml	10^4/ml	10^6/ml
Att. 1	13%	11%	10%	9%
Att. 200	10%	10%	10%	7%

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T.11 Effect of using Ultrafed Pigs Premium in fattening, on the final weight of the pigs

	113 ημ.	167 ημ.
Experimental group (kg)	$55,7^{\alpha} \pm 1,17$	$106,8^{\beta} \pm 4,70$
Control group (kg)	$55,9^{\alpha} \pm 1,76$	$102,1^{\alpha} \pm 4,09$

Swine Dysentery

- Also referred to as bloody scours or vibrionic dysentery
- Caused by Treponema hyodysenteria
- Generally, affects pigs 8-14 weeks of age
- Highly contagious
- Mortality is moderate (30%)
- Reduces overall performance

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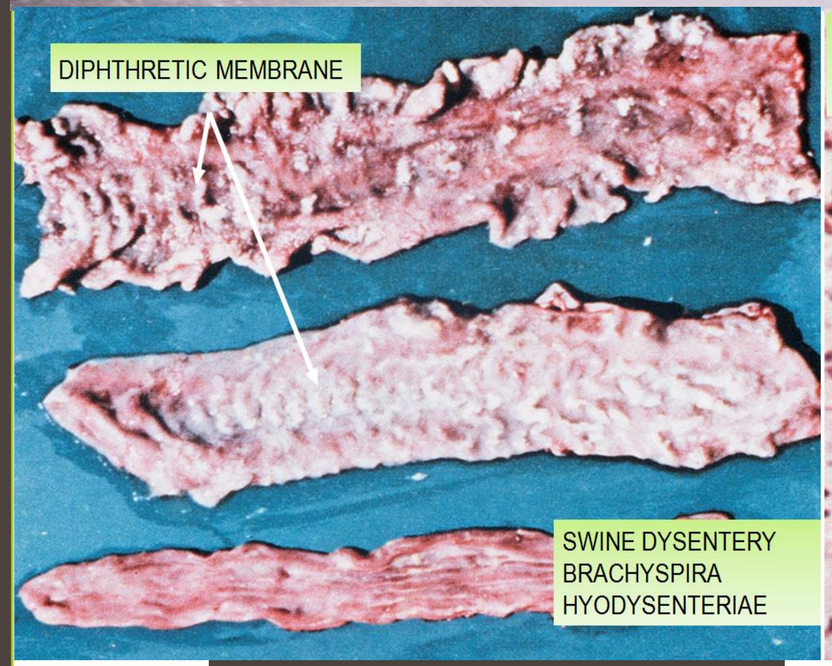
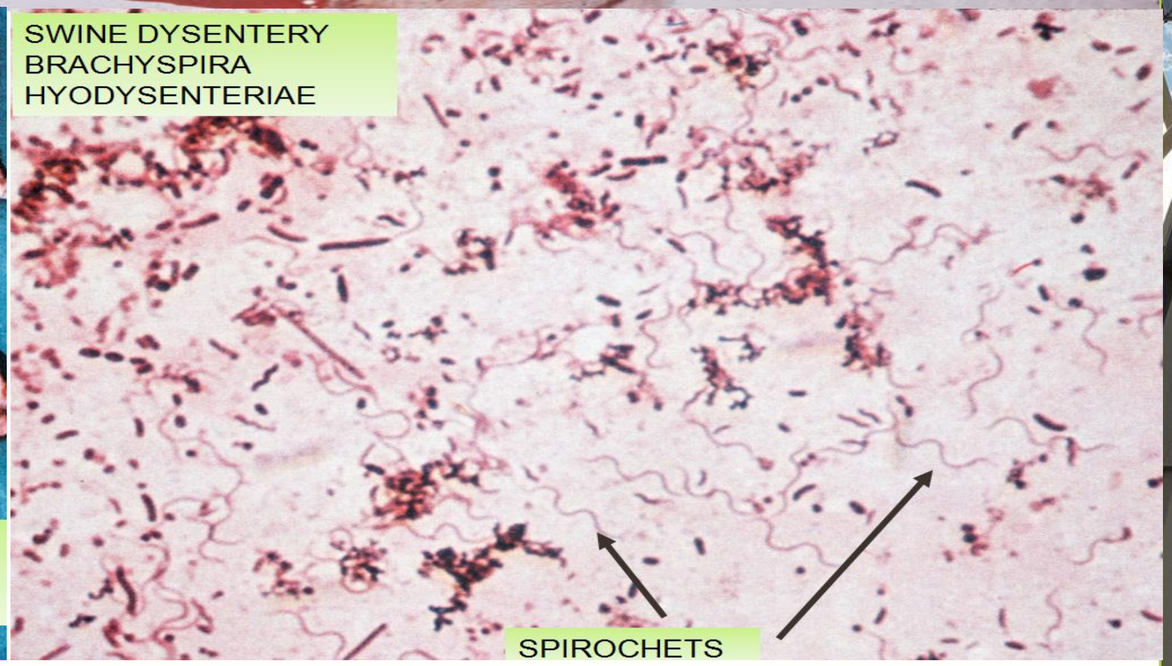
SWINE DYSENTERY BRACHYSPIRA HYODYSENTERIAE





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T. 12 PREVENTION OF SWINE DYSENTERY WTH PHYTOBIOTICS

Sensitivity of Brachyspira strains to given dilution of the herb extract was estimated on basis of diameter of the haemolysis-inhibition ring that formed around the holes. On this basis the strains were assorted into three groups as follow:

- **Sensitive (S)**: Diameter of the inhibition ring is >25 mm;
- **Moderately sensitive (MS)**: Diameter of inhibition ring is between 15 and 25 mm;
- **Resistant (R)**: Diameter of the inhibition ring is <15 mm.

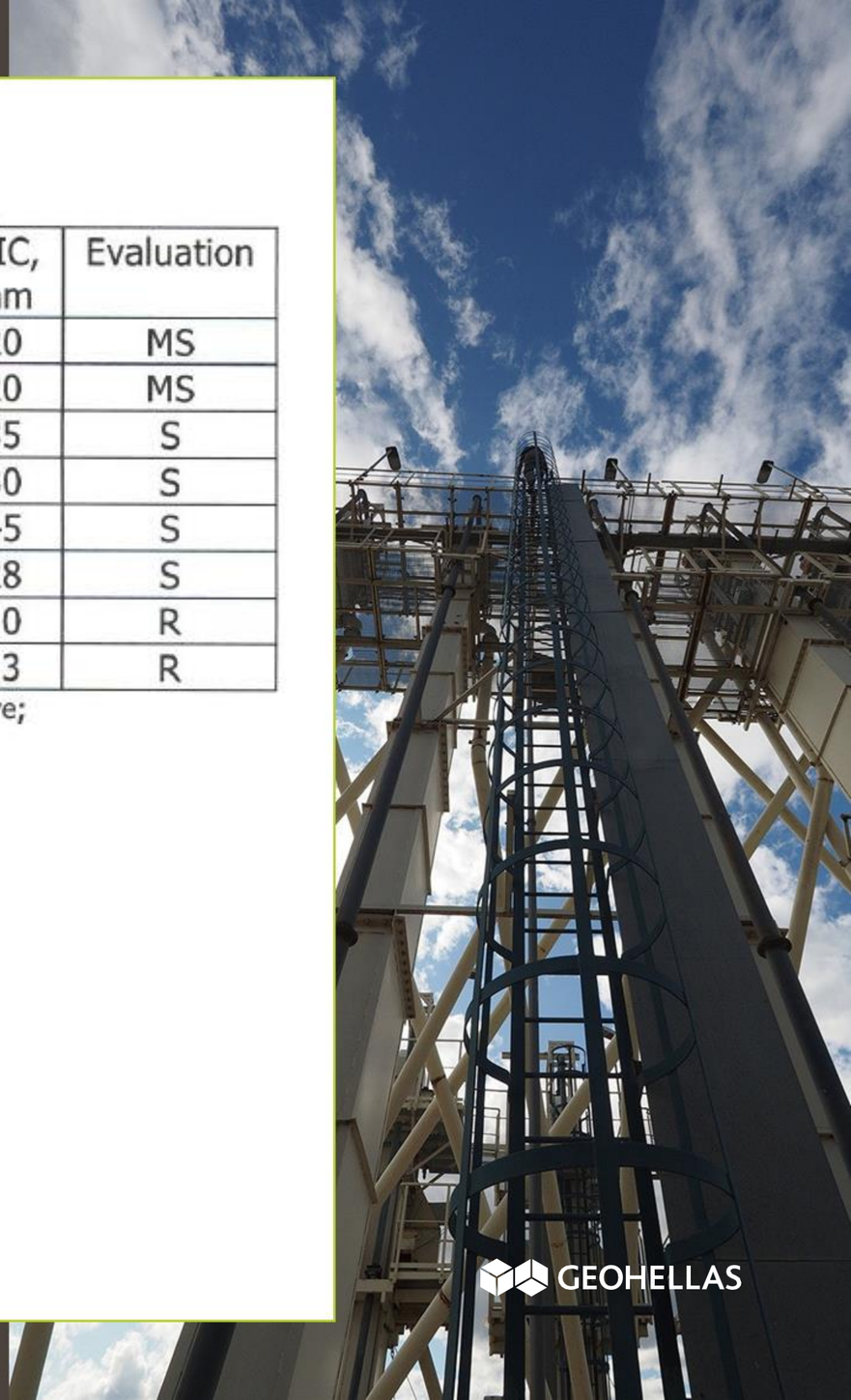
Combination of sensitive dilutions of the above herbs with stabilizers and other materials were used for manufacturing a solid feed additive for further studies.

Table 1: Sample from the MIC tests

Herb extract combinations	Dilution	MIC, mm	Evaluation
Nr. 87	250x	20	MS
Nr. 87	500x	20	MS
Nr. 89	5000x	35	S
Nr. 89	10000x	30	S
Nr. 94	5000x	45	S
Nr. 94	10000x	28	S
Nr. 95	250x	10	R
Nr. 95	500x	13	R

S: sensitive; MS: moderately sensitive;
R: resistant

L. Jakab[1], J. Kutasi[2], P. Rafai[1], L. Könyves[1], V. Jurkovich[1], P. Kovács[1], Á. Bata[3], E. Brydl[1]



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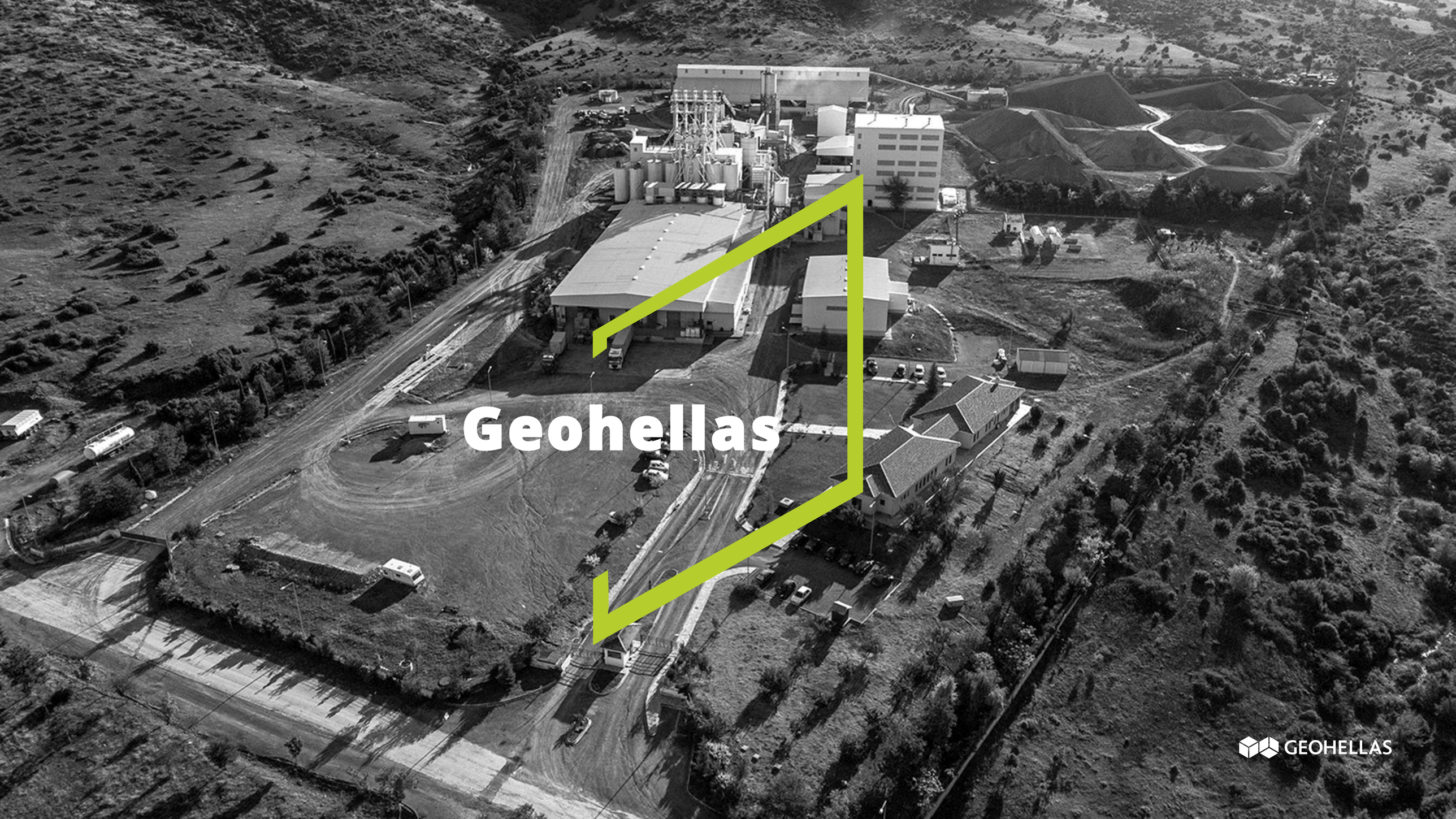

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THANK YOU

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