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IN VITRO AGE DEPENDENT CELL-MEDIATED RESPONSES TO ANTIMICROBIAL PLANT EXTRACTS IN FREE RANGE MANGALITZA PIGS

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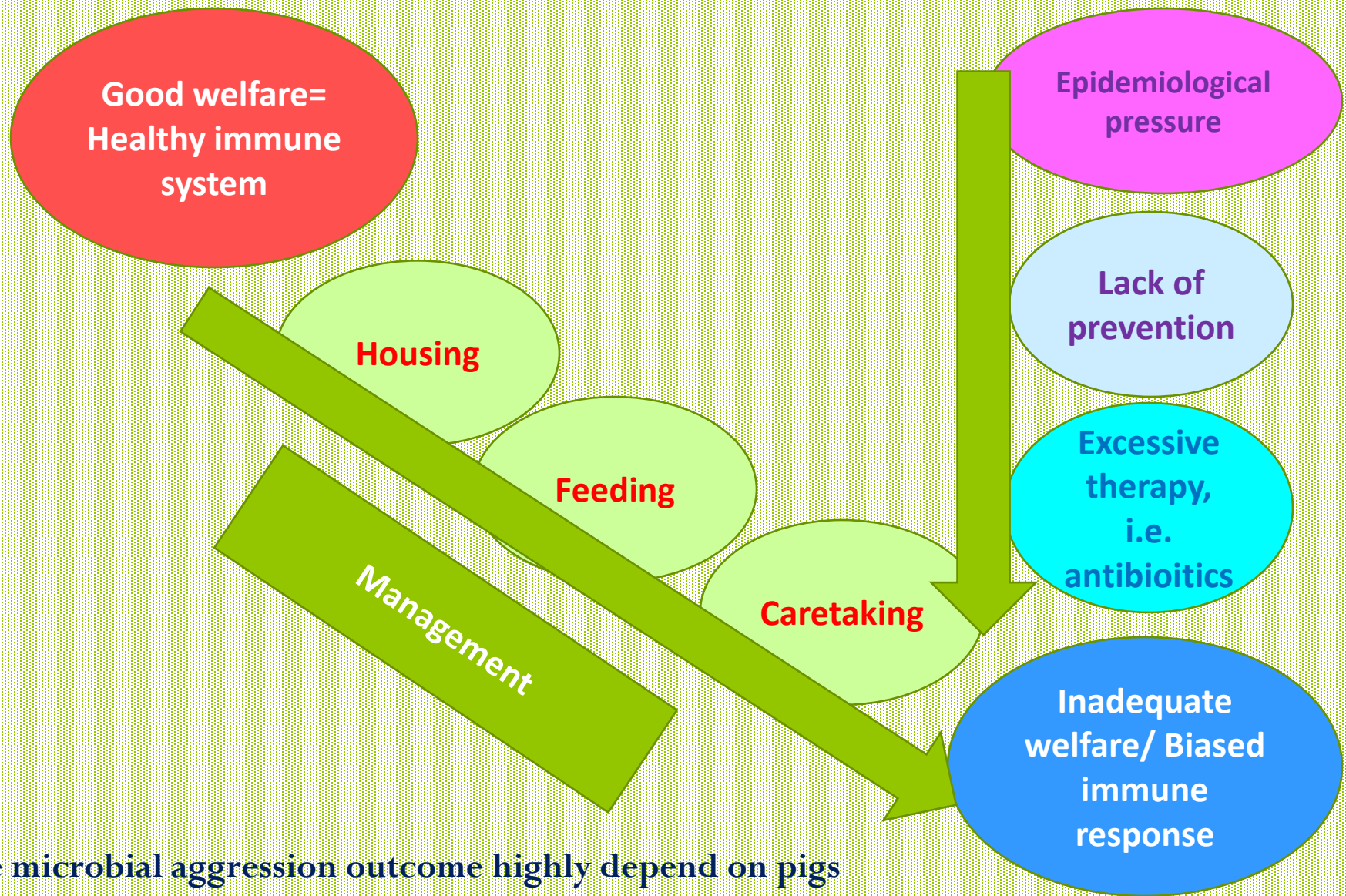
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- In Romania, swine breeding is an important tradition, the vast majority of pigs being raised in low input systems. Recently an increase in the number of free-range farms has been noticed
- Microbial diseases cause significant economic losses to pigs by loss in production, by immune suppression, and by increased morbidity and mortality in livestock.





The microbial aggression outcome highly depend on pigs immunity, and medicinal plants, available on the pastures or in the fodder pigs get, could act as immunity enhancers, strengthening the pigs' resistance to diseases.

Aim

- Elaborate strategies to improve health and welfare, by the experiments on sows and piglets, conducted on low-input outdoor farms from North Western and Central Romania.
- Achievement of a combined antimicrobial and immune stimulating effect in sows and piglets from outdoor/low input farms, provided with access to pasture and/or with pelleted feed supplements containing medicinal plant or their extracts (e.g. *Compositae*, *Artemisia absinthium*, *Cucurbita pepo*, *Coriandrum sativum*, *Tagetes spp.*, *Allium sativum*, etc.)



a-*Calendula officinalis*, b-*Thymus vulgaris*, c-*Coriandrum sativum*, d-*Allium sativum*, e-*Cucurbita pepo*



Chemical composition

<i>Calendula officinalis</i>	<i>Cucurbita pepo</i>	<i>Thymus vulgaris</i>	<i>Coriandrum sativum</i>	<i>Allium sativum</i>
Terpenoids	Carotenoids	Monoterpenes	α-pinene	Aliin
Flavonoides	Phenolic acids	Terpenoids	α-myrcene	Allicin
Quinones	Tocopherols	Flavonoid aglycones	Limonene	Diallyl disulphide
Coumarine	Flavonols	flavonoids	Citronellyl acetate	Diallyl trisulphide
Volatile oil	Minerals	glycosides,	Geranyl acetate	Ajoene
	Vitamins	Synthetic resin acids	Linalool	Methyl cysteine sulfoxide

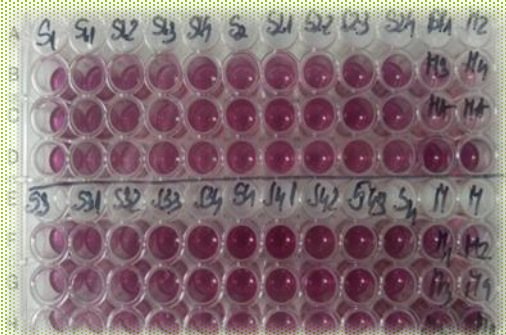


Material and Methods

The research was carried out on extensively raised Mangalitza **suckling**, **weaned piglets** and **sows** (n=10 for each group).

Blood was sampled during the official campaign for brucellosis testing, with regard to ethical and animal welfare provisions, and subjected to blast transformation test.

- blood was mixed 1:4 with RPMI1640 (Sigma Aldrich, USA), divided in 200µl aliquots in 96 well-plates and
- supplemented with alcoholic plant extracts (*Calendula officinalis*, *Thymus vulgaris*, *Allium sativum*, *Coriandrum sativum*, *Cucurbita maxima*), 1.5 µl/well.



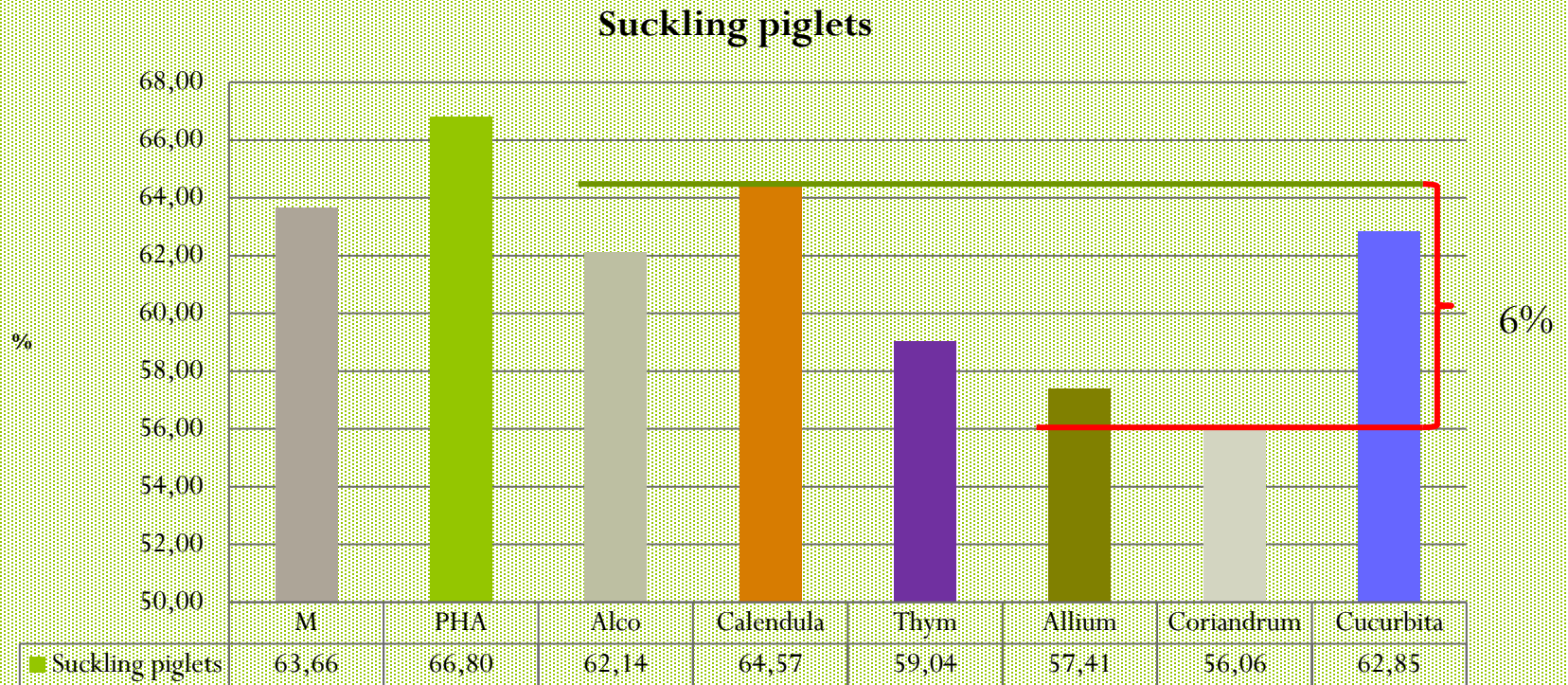
- incubation at 37°C for 48 h, residual glucose was quantified spectrophotometrically (SUMAL PE2, Karl Zeiss, Jena) and glucose consumption was calculated (%).

$$(\text{RPMI gluc} - \text{sample gluc}) \times 100 / \text{RPMI gluc} = \text{SI}\%$$

The groups were compared by Student's t test for statistical significance of the results (p<0.05)

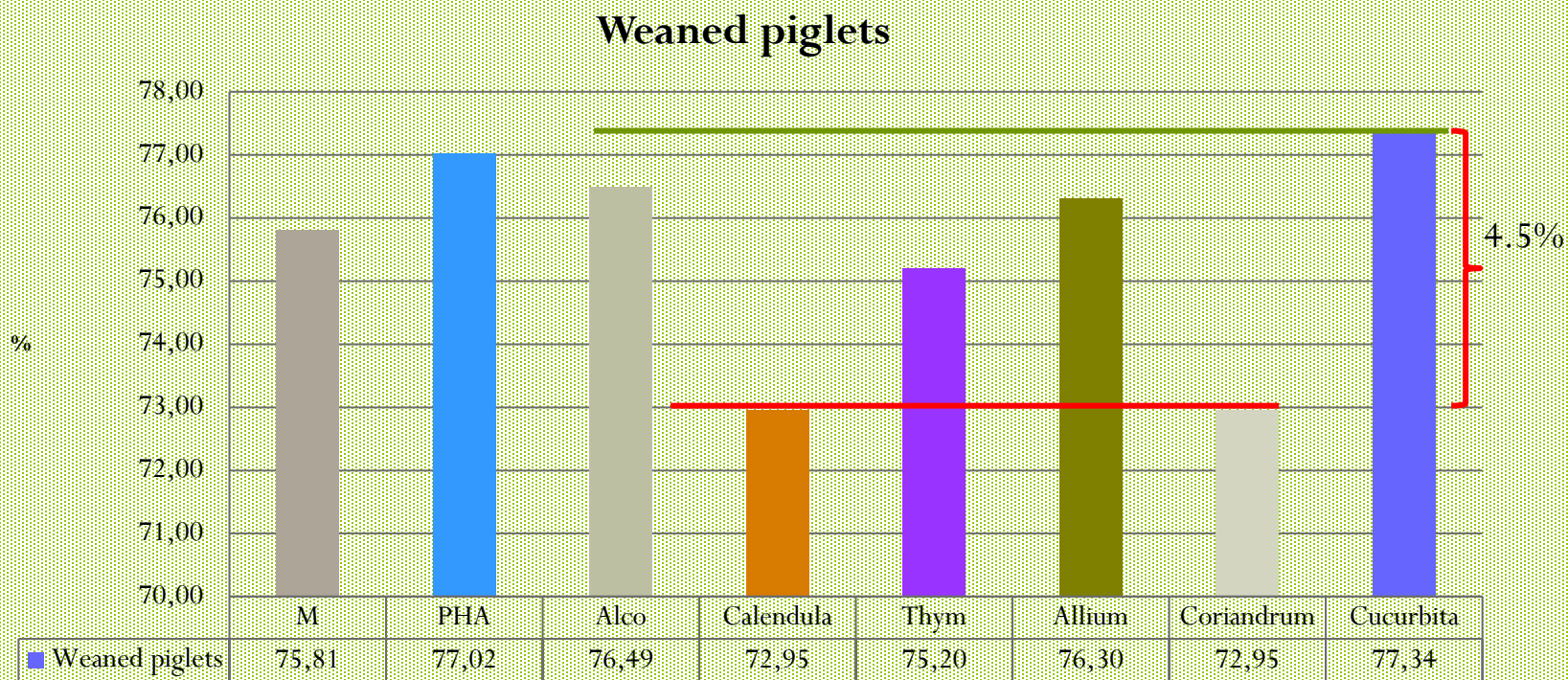


Results



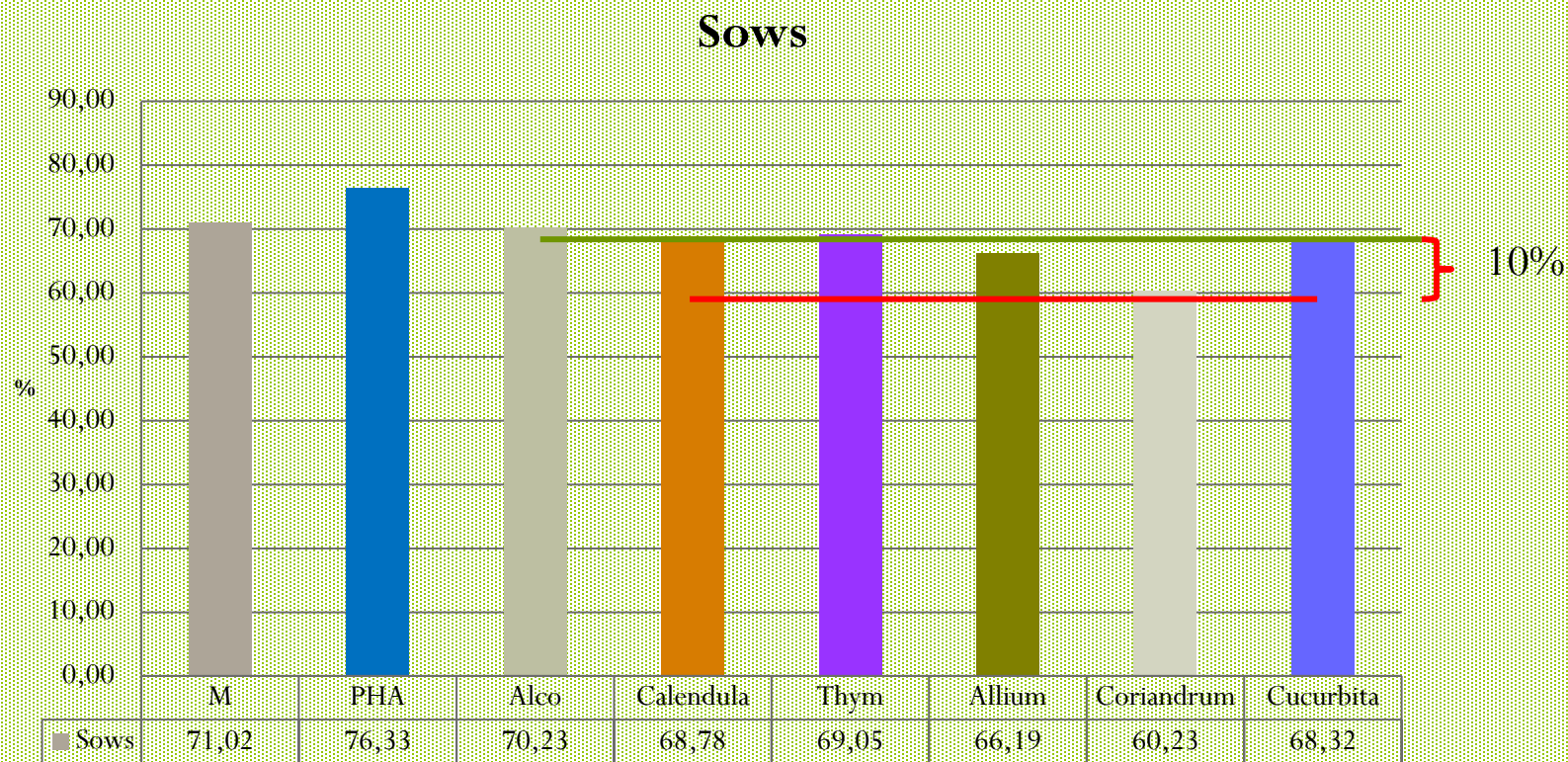


Results





Results





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T test (p values) piglets – weaned piglets

M	PHA	Alco	<i>Calendula</i>	<i>Thym</i>	<i>Allium</i>	<i>Coriandrum</i>	<i>Cucurbita</i>
1.6E-05	1.7E-03	1.6E-06	1.8E-02	2.3E-06	1.6E-06	2.0E-04	2.2E-04

T test (p values) weaned piglets - sows

M	PHA	Alco	<i>Calendula</i>	<i>Thym</i>	<i>Allium</i>	<i>Coriandrum</i>	<i>Cucurbita</i>
0.1982	0.8285	0.0066	0.0359	0.0071	0.0013	0.0003	0.0001

The results indicated statistically significant differences between the young age groups, suckling and weaned piglets ($p=0.017$ to 0.000016) for all plants except marigold, for weaned piglets and sows ($p=0.0001$ - 0.0359) for all plant extract, while for suckling piglets – sows $p=0.0035$ and $p=0.0461$ were recorded for thyme and garlic, respectively.



Conclusion / Discussion: The plant extracts used known for biological effects impacted based on age of the pigs and plant family, proving their immune stimulating capacity.

The immune stimulating activity of the plant essential oils depended on their taxonomy but also on the age of the pigs (*Calendula* and *Cucurbita* in suckling piglets, *Cucurbita* in weaned piglets, none in sows)



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Thank you!

Teşekkür ederim

