



 **World
Rabbit
Congress
2016**
Qingdao, China



Convegno ASIC 2016
11th WRC: Inviati speciali in Cina

30 settembre 2016, Padova



11th WORLD RABBIT CONGRESS, 15-18 June 2016, Qingdao, China

5. NUTRITION AND DIGESTIVE PHYSIOLOGY

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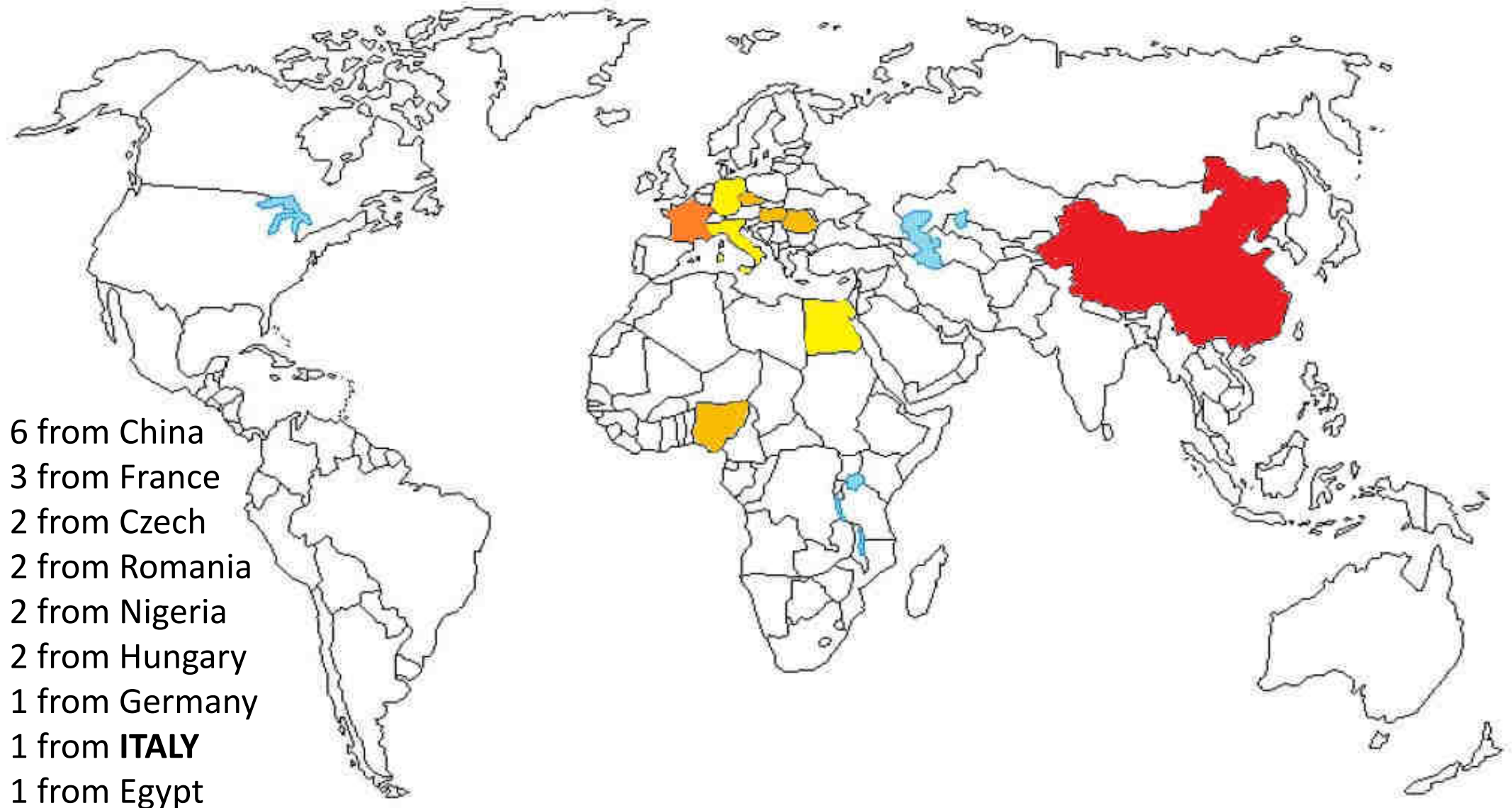
20 papers

 6 oral presentations

 14 posters

11th WORLD RABBIT CONGRESS, 15-18 June 2016, Qingdao, China

Country of the scientific papers



TOPICS	TYPE OF PRESENTATION	COUNTRY
Use of different feed	2 oral presentations 2 posters	Nigeria, China, France
Effect of dietary supplementation	1 oral presentation 6 posters	Egypt, China, France
Study on does	1 oral presentation 1 poster	ITALY, France
Study on suckling kids	1 oral presentation 1 poster	Hungary
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Use of different feed for rabbit nutrition

- Performance and digestion of rabbits fed bread waste and *Moringa oleifera* leaf as energy and protein sources.

Ayandiran S.K., Odeyinka S.M. (Nigeria)



- Utilization of different plant leaf meals by growing rabbits.

Dairo F.A.S., Agunbiade S.O., Durojaiye B., Onisile D.S. (Nigeria)

Gliricidia sepium, Leucanea leucocephala, Tridax procumbens, Aspilia africana



- Effect of dietary citrus pulp on growth performance, blood metabolites of rabbits.

Lu J., Long X., He Z., Yang Y., Shen Y., Pan Y., Zhang S., Li H. (China)



- Estimation of digestible energy content and protein digestibility of raw materials by the rabbit, with a system of equations.

Lebas F. (France)

From Nigeria :



 Performance and digestion of rabbits fed bread waste and *Moringa oleifera* leaf as energy and protein sources.

Ayandiran S.K., Odeyinka S.M. (Nigeria)

INTRODUCTION: The increasing price of the conventional feedstuffs in rabbit's diet has necessitated the search for agro-industrial by-products and forages which are cheap and available all year round.

AIM: This study evaluate the performance and digestion of rabbits fed bread waste and *Moringa oleifera* leaf as energy and protein sources.



MATERIALS AND METHODS:

- Mixed breeds rabbits of 5 weeks old
- Four mash diets were compounded with inclusion of bread waste and *Moringa oleifera* leaf at a level of 0, 25, 50 and 100% (T1, T2, T3 e T4)
- Calculations were: feed intake, daily weight gain, feed conversion ratio and nutrient digestibility coefficients of rabbits.



RESULTS:

Dry matter: T1> T2>T3>T4

Crude protein and metabolizable energy contents of T2, T3 and T4 were higher than T1.

Bread waste and *Moringa oleifera* are unconventional energy and protein sources for weaner rabbits especially in the dry season.

The performance characteristic of rabbits fed the experimental diets:

Parameters	T1	T2	T3	T4	PROB.	MSE
Feed intake (g/day)	43.1	45.3	42.6	48.4	0.50	1.20
Initial weight (g)	536	543	411	561	0.20	27.7
Final weight (g)	1000	1100	1028	1165	0.20	30.7
Live weight gain (g)	646 ^a	557 ^c	614 ^b	604 ^b	0.048	20.5
Weight gain (g/day)	7.7 ^a	9.3 ^{ab}	10.2 ^a	10.1 ^a	0.021	0.40
Feed conversion ratio	6.05 ^a	4.90 ^{ab}	4.15 ^b	4.83 ^{ab}	0.057	0.30

Means with different letters on the same row differ significantly (Duncan's multiple range). MSE: mean square error

CONCLUSION:

The inclusion of bread waste and *Moringa oleifera* leaf as energy and protein sources led to high protein and energy digestion in rabbits and show improved performances.

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Effect of dietary supplementation

- Effect Of dietary supplementation with potential **antioxidants** and **tannins** on growing rabbit performance during summer season.

Abdel-Khalek A.M., Greash M.K. (Egypt)

- Effects of dietary **vitamin B6** on the non-specific immune response of growing rabbits.

Liu G.Y., Zhao N., Zhu Y.L., Wu Z.Y., Liu L., Li F.C. (China)

- **Acetate** inhibits hypothalamic JNK signaling in rabbits.

Liu L., Sui X., Li F. (China)

- Influence of a mycotoxin binder compound, **Defitox**[®], on the performances and some biochemical and histological characteristics of growing rabbits fed by mycotoxins contaminated feed.

Malabous A., Colin M., Gerfault V., Prigent A.Y., Shi D. (France)

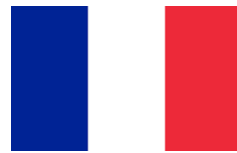
- Effect of dietary **arginine** on rabbit growth and mRNA expression of GM-CSF in jejunum.


Qin F., Pan X.Q., Yang J., Shao L., Li S., Zhang L.L., Li J. (China)

- Effects of **Bacillus coagulans** on performance and intestinal physiology of growing rabbits.

Ren YJ., Zhu L., Xie X.H., Kuang L.D., Guo Z.Q, Zhang X.Y., Li CY., Yang C., Zhang C.X., Zheng J., Lei M. (China)

From FRANCE :



 Influence of a mycotoxin binder compound, Defitox[®], on the performances and some biochemical and histological characteristics of growing rabbits fed by mycotoxins contaminated feed.

Malabous A., Colin M., Gerfault V., Prigent A.Y., Shi D.

INTRODUCTION: Mycotoxins are secondary metabolites of moulds which grow on plant. They impact negatively the performance of animals such as rabbits. Three concepts can be used to reduce mycotoxin effects: biotransformation of mycotoxins into a non toxic form, binding of mycotoxins, liver protection and immunity preservation.

AIM: Defitox[®], the mycotoxin binder used in this trial is designed to respond to the latter two concepts previously mentioned.

MATERIALS AND METHOD:

- Experimental farm
- 516 post weaning rabbits divided in two groups: control diet (C) and Defitox[®] diet (DG)
- Experimental feeds with high content of micotoxin (Deoxyvalenol, Zearalenone, Fumonisin and Tenuazonic acid)
- Defitox[®]: a mycotoxin binder **Bentonite**, **oligo-Saccharides** from bacteria walls, and activated **charcoal**. The product also contains plant extracts to protect the liver.

RESULTS:

- ↓ Mortality (with enterocolitis as a main cause)
- ↓ Digestive pathologies
- ↑ Weights ↑ Growth rate (against deoxynivalenol effect)

- < Weight of the vermiform appendix
- < Leucocytes and monocytes
- Zearalenone (ZEA) increase ALP → DG had lower ALP → preservation of the liver in DG (alleviating the action of ZEA)

CONCLUSION:

This study demonstrate the interest to use a complex of mycotoxin-binders associated with a liver protector in rabbit feed contaminated by high levels of mycotoxins. In these contaminated conditions of feeding the high mortality rate was reduced by 20%, while post-weaning growth was improved. The weight of the vermiform appendix and the total number of lymphocytes was lower in Defitox group suggesting a lower stimulation of the immune system.

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Study on does

- Effect of a low energy feed given ad libitum on preparation of young rabbit females for their reproductive career- preliminary results.

Dorchies P., Menini F.X., Salaün J.M., Bourdillon A., Tétrel P. (France)

- Metabolic and biochemical pre-partum conditions in primiparous and multiparous rabbit does with different litter size.

Minuti A., Uboldi O., Calamari L., Piccioli-Cappelli F., Bani P., Ferrari A., Gachiuta O., Trevisi E. (Italy)

Study on suckling kits

- Piglet feed based additional solid feed for suckling kits.

Kacsala L., Gerencsér Zs., Szendrő Zs., Nagy, I., Radnai I., Odermatt M., Matics Zs. (Hungary)

- Additional solid feed for suckling kits - effect of thyme supplementation.

Kacsala L., Szendrő Zs., Gerencsér Zs., Radnai, I., Kasza, R., Odermatt M., Matics Zs. (Hungary)

From ITALY :



Metabolic and biochemical pre-partum conditions in primiparous and multiparous rabbit does with different litter size.

Minuti A., Ubaldi O., Calamari L., Piccioli-Cappelli F., Bani P., Ferrari A., Gachiuta O., Trevisi E.

INTRODUCTION: In the reproductive rabbit does, a critical phase is the late pregnancy period. The last week of gestation can be very stressful for the female, especially if the number of foetuses is high.

AIM: This study describes, the pre-partum metabolic and biochemical conditions in primiparous and multiparous does. It investigates the relationship of plasma parameters with the litter size, too.

MATERIALS AND METHOD:

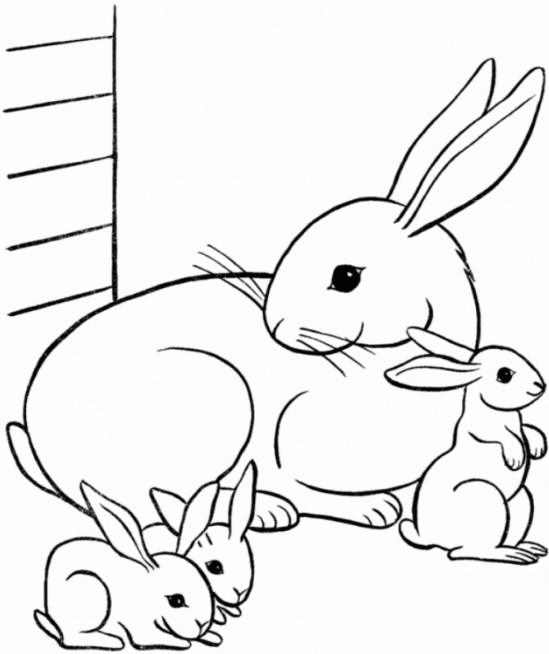
- Commercial hybrid rabbit does: 13 nulliparous (**PR**) does (24 weeks old), and 30 multiparous (**MU**) rabbit does (39 weeks old)
- Blood collection: 4 days before parturition
- Registration of the offspring at calving

RESULTS:

- Before parturition the **PR** had a **lighter body weight**
- At calving PR had **less offspring**
- The plasma parameters showed several differences
- PR vs MU:
 - higher concentration of NEFA and β -hydroxybutyrate
 - lower positive acute phase proteins (ceruloplasmina and haptoglobin)
- Markers of acute phase response confirms the **better condition of PR** compared to MU.
- Positive relation between number of offspring and metabolic and inflammatory problems

CONCLUSION:

- The last days of pregnancy are **crucial** for the health of rabbit does.
- There are important **differences** between PR and MU does for metabolic and inflammatory status.
- PR have a higher body fat mobilization despite the lower litter size, but a better inflammatory status than MU.



These results could be useful to design different strategies, i.e. nutritional and managerial, to meet their specific requirement. Moreover, the high number of gestated foetuses is confirmed to be a stressful factor for rabbit does health.

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Effect of feed restriction:

One week **feed restriction** in early weaned rabbits:

- 1- Performance and internal organs development. Tůmová E., Chodová D.
- 2- Slaughter parameters and muscle fibre characteristics. Chodová D., Tůmová E., Volek Z. (Czech)

Others

- Changes in blood parameters in post-weaning rabbits fed by **different fibre** or starch dietary level.

Bălăceanu R.A., Cotor G., Codreanu I., Stoica L., Dojană N. (Romania)

- **Serum digestive enzyme** activity before and after weaning in rabbits fed on protein, starch or fiber enriched diets.

Bălăceanu R.A., Raită Șt., Tobă G.L., Stoica L., Dojană N. (Romania)

- *Growth and expression of **CaABP-D28K** in small intestine of the rabbit, according to wave lengths of light.*

Pan X., Qin F., Yang J., Pan Y., Shao L., Li S., Zhang L., Wang J.(China)

- *How does the **structure of feedstuffs** influence ethological and nutritional parameters of rabbits.*

Lang C., Masthoff T., Spies M., Weirich C., Hoy St. (Germany)



From Germany :

 **H**ow does the structure of feedstuffs influence ethological and nutritional parameters of rabbits.

Lang C., Masthoff T., Spies M., Weirich C., Hoy St.

INTRODUCTION: The structure of feedstuffs for rabbits can influence rabbit performance, behaviour and nutrition physiology.

AIM: To analyse the direct influence of different structure of feedstuffs on different parameters of ethology (feed intake behavior, use of a gnawing stick) in adult rabbits.

MATERIALS AND METHOD:

- Rabbit does (12-16 weeks old)
- 3 different structured alfalfa type: chopped, pelleted, grinded
- Infrared videocam
- After 4 weeks rabbits were slaughtered to determine nutritional parameter



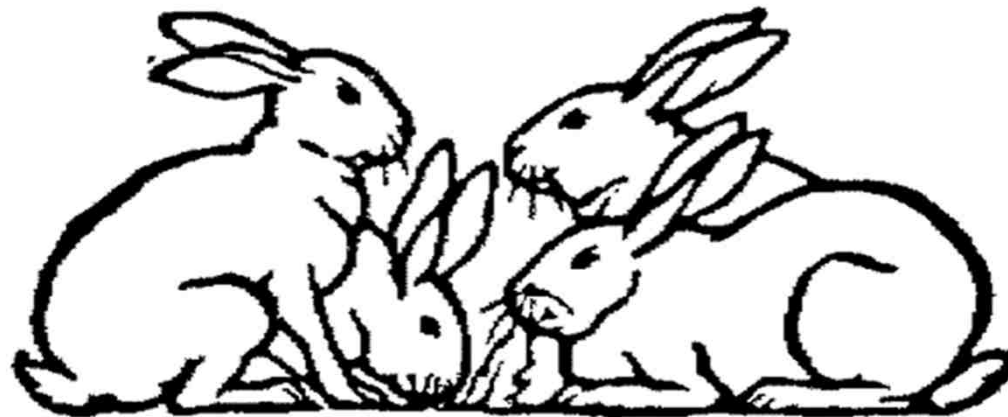
RESULTS:

- Chopped hay diet rabbits spent more time with feed intake
- The feed intake time for 0,1g of feedstuff was **faster** in **pellet**
- **Pelleted diet** used more frequent the gnawing stick.
- Stomach pH was lower in **grinded**
- Stomach of rabbit fed with pellets was the heaviest.
- Rabbit fed with pellets and grinded feedstuff had higher dry matter content in caecal chyme.



CONCLUSIONS:

- Effect of the feed structure on **feeding behaviour** and **digestive physiology** parameters
- Fine structure of **feedstuff pressed** in pellets gave rabbits the possibility of a **very fast feed** intake
- **Pellet** feedstuff results in shorter feed intake duration → intensive use of **gnawing stick**
- **Pellets** and **grinded** → high level of fine particles resulted → **higher caecal dry matter** content
- **Chopped hay** → biggest structure in stomach and **less medium particle size** in caecal chyme



感谢您的关注

(Grazie per l'attenzione)