Convegno ASIC 2016

11th WRC: Inviati speciali in Cina

30 settembre 2016, Padova

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

6. Pathology and Hygiene

Romina Brunetta
Istituto Zooprofilattico delle Venezie

Michele Marino
Università degli Studi di Bari “Aldo Moro”

32 papers :

- 2 invited presentations
- 8 oral presentations
- 22 posters

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

6.1 Pathology and Hygiene

Romina Brunetta
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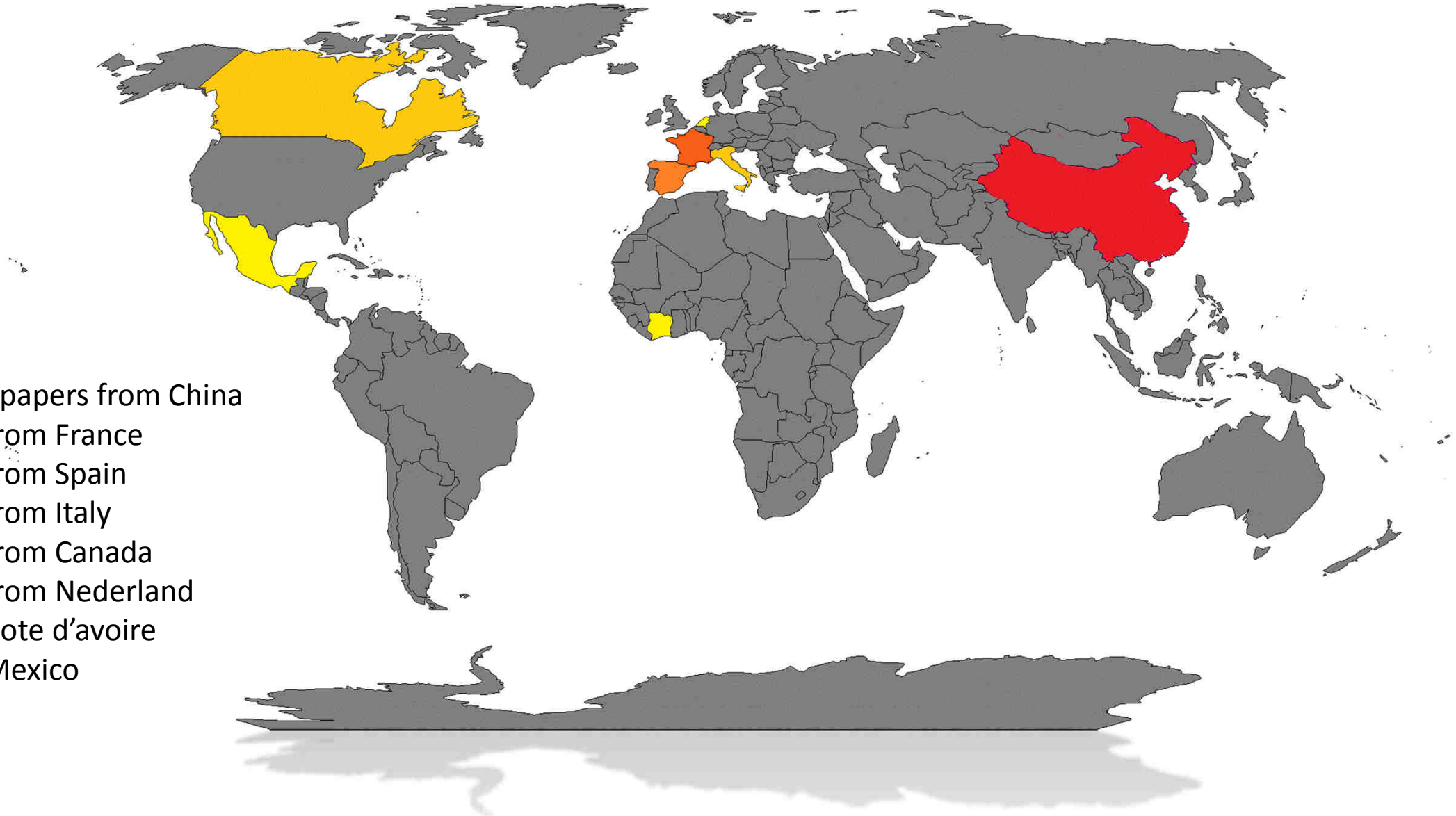
Country of the scientific papers



14 papers from China
6 from France
4 from Spain
3 from Italy
2 from Canada
1 from Nederland
1 Cote d’avoire
1 Mexico

Invited paper: Recent advances in ERE growing rabbits

Badiola I., Perez de Rozas A., Gonzales J., Aloy N., García J.

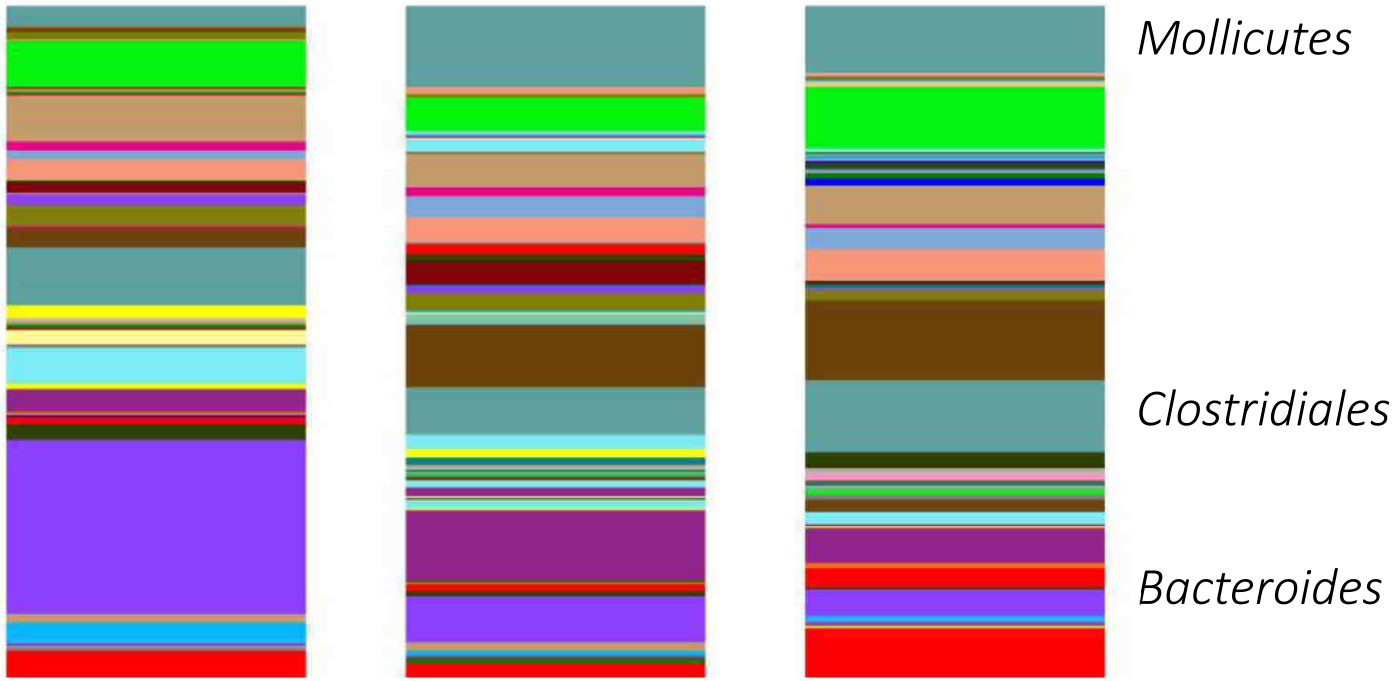
AIM

- Microbiota profile in rabbit of different ages
- Comparative analysis of the ERE-related and ERE- non related *Cl. perfringens*
- A new way to control negative effects of ERE, inoculating different strains of *Bacteroides* spp.

MATERIAL AND METHOD

- Sampling cecal microbiota in rabbit with/without ERE, fed different diets
- QRT-PCR of 10 young rabbit/doe to analyze the *in vivo* effect of some *Bacteroides spp*. strains (*B. dorei, B. fragilis CV-0293, B. fragilis CV-0315, B. acidifaciens*, control)

RESULTS



Microbiota profile of rabbit with 25, 39 or 70 d

- *Bacteroides* was the most frequent Operational Taxonomic Unit at 25d, and than it decrease
- *Mollicutes* was present at low level at 25 d and than it increase
- *Clostridiales* were similar in all the ages

Rabbits with ERE showed **dysbiosys**,
correlation between ERE – microbiota different/genus species isn't sufficient to confirm the pathogenesis of ERE.

RESULTS

The electrophoretic profile of the of different *C. perfringens* strains associated with the ERE symptomatology showed proteins that are not present in C. perfringens strains without ERE association.

Bacteroides dorei CV-0183, *Bacteroides fragilis* CV-0293, *Bacteroides fragilis* CV-0315 reduced the pro-inflammatory cytokines and increased the expression of the MHC II gene.

The reduction of inflammation and the activation of macrophages and dendritic cells could < ERE

The use of the *Bacteroides dorei* and *fragilis* (CV-293 e CV-315) for their probiotic effect on rabbit with ERE is still studying.

CONCLUDING

- ERE is a high mortality disease in rabbit characterized by a specific intestinal dysbiosys.
- Specific strains could play a principal role in the pathogenesis or in the control of negative effects of ERE
- This group continue its research on *C. perfringens* and *Bacteroides fragilis* or *dorei*, to evaluate a vaccine against ERE and to develop a probiotic that could help to the control of ERE.

Coccidiosis in rabbit

↗ Prevalence of coccidiosis in domestic rabbits in the three gorges reservoir area of China.

Yang R., Cao L.T., Fu L.Z.,Wang Y.K.,Tan Q.H., Li C.X., Zhang Y.F., Xu D.F., Wang X.Y. (China)

↗ Rabbit's coccidian species in a tropical endemic area.

Kimsé M., Dakouri S.A., Koné M.W., Komoin O. C., Coulibaly M. , Yapi Y.M., Fantodji A.T., Otchoumou A. (Côted'Ivoire)

Coccidiosis in rabbit

↗ Prophylactic and therapeutic efficacy of ponazuril against rabbit coccidiosis.

Li Y., Wang Y., Tao G., Cui Y., Suo X., Liu X..(China)

↗ Eimeria media: selection and characterization of a precocious line.

Gu X., Wang Y., Fang S., Li C., Tao G., Cui P., Suo X., Liu X. (China)

↗ Attenuation of Eimeria intestinalis through selection of a precocious line.

Li C., Wang Y., TaoG., Gu X., Suo X., Liu X. (China)

↗ Cloning and characterizing profilin gene from rabbit coccidia Eimeria magna.

Tao G., Wang Y., Li C., Gu X, Liu X., Suo X. (China)

↗ Transgenic Eimeria magna expresses eYFP throughout the entire life cycle.

Tao G., Wang Y.,Li C, Liu X., Suo X. (China)

↗ Stable transfection of Eimeria intestinalis and investigation of its life cycle, reproduction and immunogenicity.

Shi T., Tao G., Bao G., Suo J., Fu Y., Hao L., Suo X. (China)

↗ Protection of rabbits against coccidiosis by co-infection with Eimeria magna, E. intestinalis and E. media.

Wang Y., Tao G., Li C., Gu X., Suo X., Liu X. (China)

Other parassites in rabbit

↗ Antifungal activity of ethanol extract of Phellodendron amurense and Cochinchina mormodica against Microsporum canis-induced dermatitis in rabbits.

Xiao C., Liu Y.,.Ji Q., Wei Q., Li K., Pan L., Bao G. (China)

↗ Sainfoin in rabbit diet: impact on performances and on a nematode challenge.

Legendre H., Hoste H., Gidenne T. (France)

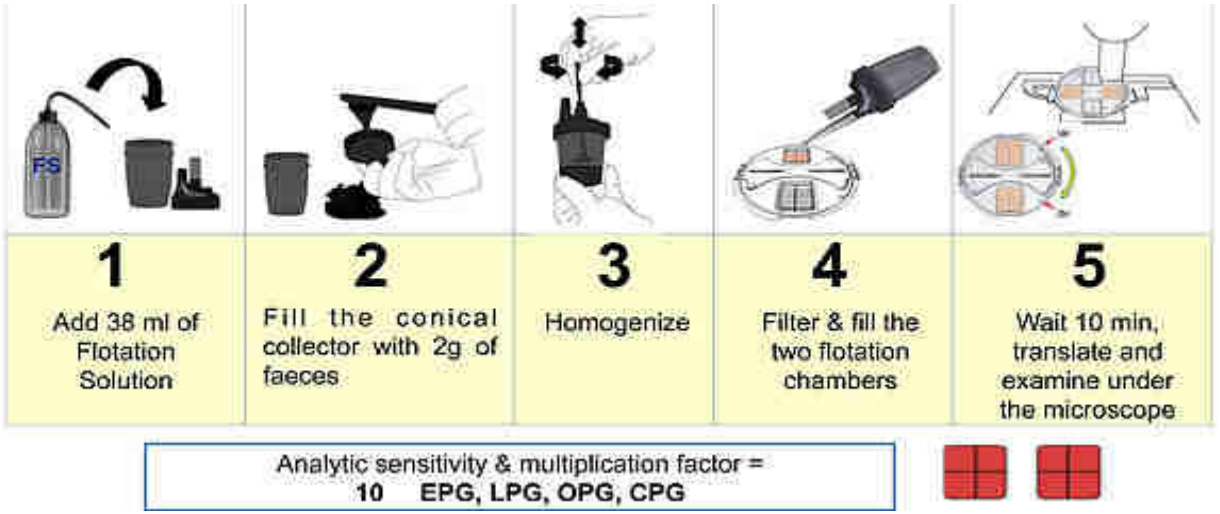
Natural Passalurus ambiguus infestation in a rabbit farm. Interest of the mini flotac method to assess helminth eggs and to ensure 1 year follow-up of animals after flubendazole based treatments.

Le Normand B., Chatellier S., Mercier P. (France)

AIM: to assess the helminth status of the farm and to ensure the follow up of animals after treatment by using copromicroscopic MINI-FLOTAC method

MATERIAL AND METHOD:

- Fecal samples collected at noon and at the end of the day at each season time for one year in a intensive breeding rabbit farm
- Mini FLOTAC method
- Treatment if eggs detected



RESULTS

- The most sensitive animals were young animals of 12 to 15 week old and non-pregnant does till the second cycle of production.
- Despite a first treatment in winter, positive fecal samples collected in the other period of the year showed new infestation in animals:
  - Sticky eggs of pinworms are laid by the worms in the perianal skin
  - Enviroment egg contamination?
  - Lack of efficancy?

CONCLUSION

Passalurus ambiguus is a parassite frequently encountered in rabbit farms.

The quantitative coprological diagnosis for assessing helminth eggs without using necropsy on rabbits should be recommended.

The Mini Flotac method met all the requirements for a simple sensitive test.

Targeted animals for sampling procedure and follow-up i.e., nulliparous, primiparous and inseminated but non-pregnant rabbits are the key success.

Antimicrobial consumption and antimicrobial resistance in rabbit

↗ Antimicrobial resistance and drug consumption in rabbit farming.

Agnoletti F, Brunetta R., Bonfanti L., Ferro T., Guolo A., Marcon B., Puiatti C., Bano L. (Italy)

↗ Evaluation of antimicrobial resistance in Ontario commercial meat rabbits.

Kylie J, Reid-Smith R., McEwen S., Weese J.S., Boerlin P., and Turner P.V. (Canada)

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

6.2 Pathology and Hygiene

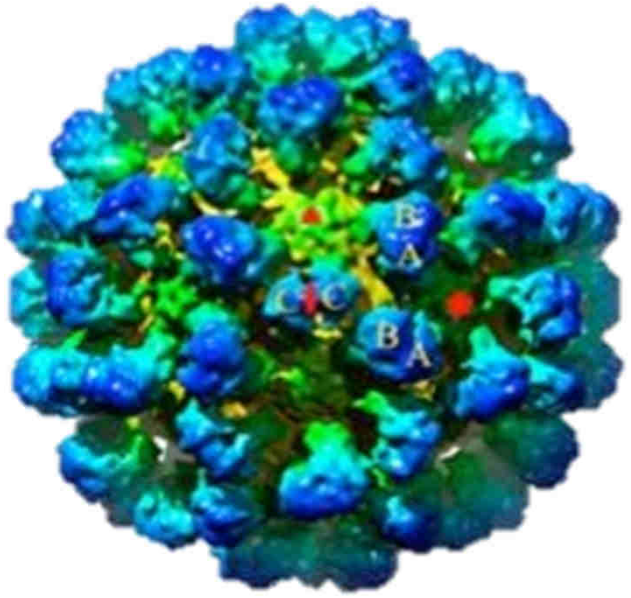
Michele Marino
Università degli Studi di Bari "Aldo Moro"

Main paper

CONTROL OF RABBIT COCCIDIOSIS AND RABBIT HAEMORRHAGIC DISEASE: IMPACT OF RECOMBINANT DNA TECHNOLOGY

Suo S.[1,2,3]*, Wang F.[4,5,6]*, Liu X.Y.[1,2,3], Song Y.H.[4,5,6], Wang Y.Z.[1,2,3], Xue J.B.[2], Tao G.R.[1,2,3],Fan Z.Y.[4], Li C.[1,2,3],Hu B.[4], Gu X.L.[1,2,3], Wei H.J.[4], Qiu R.L.[4], Liu X.[4]

Coccidia

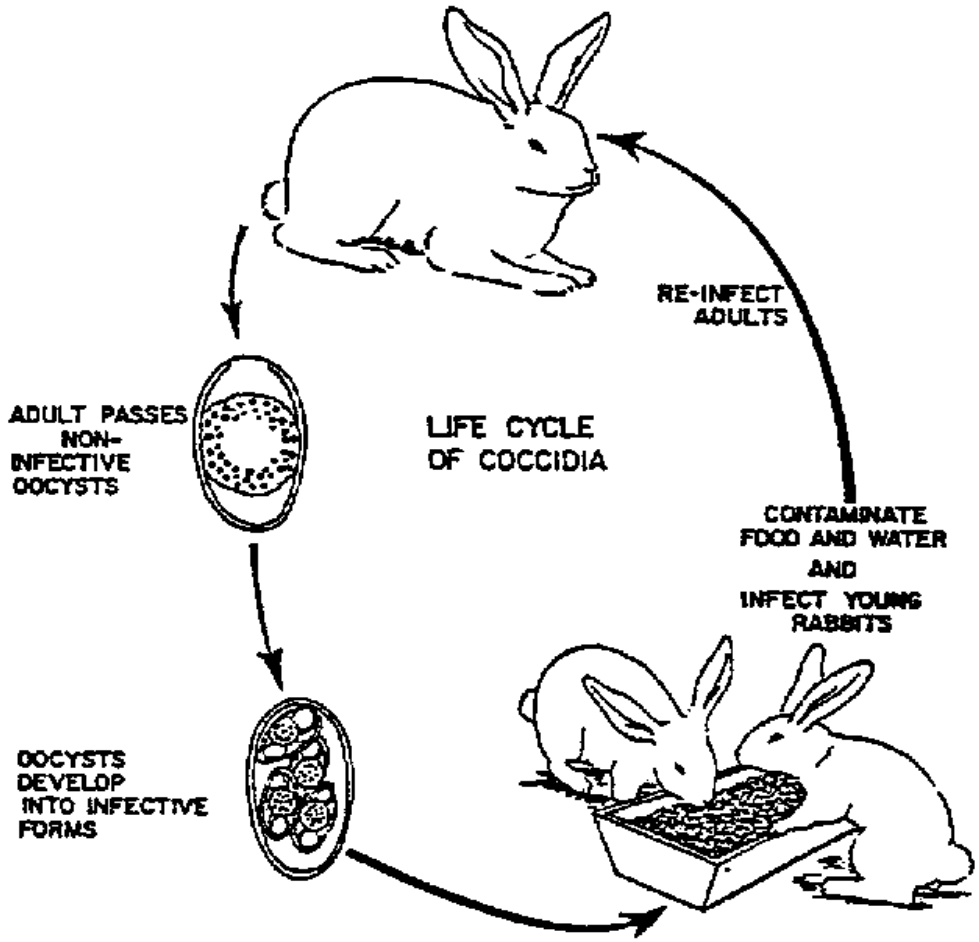


RHDV

Rabbit coccidiosis

Species	Intestinal segment (except *E. stiedai*)
E. coecicola	appendix, sacculus rotundus, Peyer's patches
E. exigua	duodenum–ileum; successively moves from proximal to distal parts of the small intestine
E. flavescens	1st AG small intestine, 2nd–5th AG caecum
E. intestinalis	lower jejunum and ileum
E. irresidua	jejunum and ileum
E. magna	jejunum and ileum, in a lesser extent duodenum
E. media	duodenum–jejunum, low concentration of the parasite in the ileum
E. perforans	maximal parasite concentration in the duodenum, but also in the jejunum and ileum
E. piriformis	colon
E. vejdovskyi	ileum
E. stiedai	liver

(Pakandl, 2009)



Control of rabbit coccidiosis by medication

« If there were no anticoccidial drugs, there would not have been modern intensive rabbitries. »

Suo et al., 2016

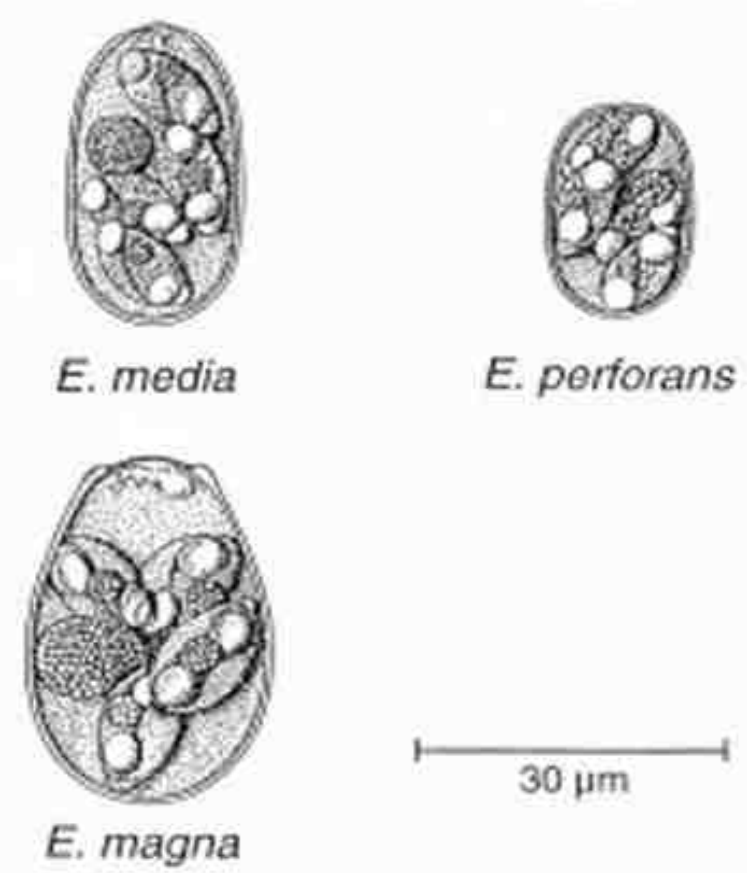
Limits:

Drugs resistance

Drug residue in the rabbit products

Drug toxicity (Higher dosage of narasin)

Few drugs available for rabbits



Vaccination as an alternative strategy for the control of rabbit coccidiosis

Rabbits recovered from coccidiosis are resistant to re-infection

Vaccination by wild-type strains

Vaccination by attenuated strains

Subunit vaccines

Live vector vaccines

Live viral vector vaccines

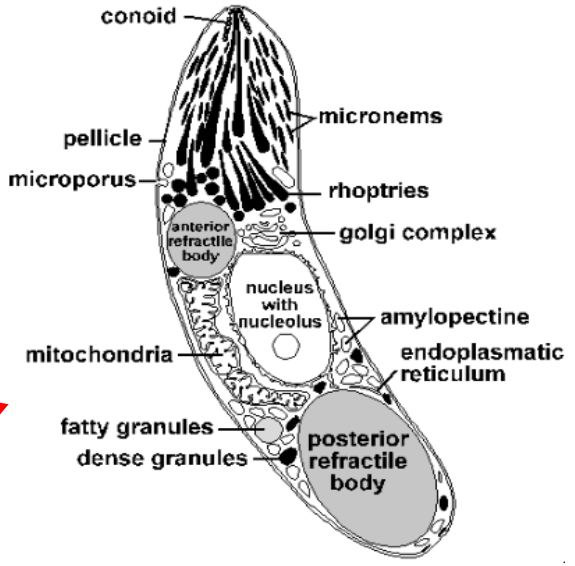
Live bacterial vector vaccine

Live oocysts as a vaccine vector

Live vector vaccines

For a efficient expression of exogenous antigens:

- Use of strong regulatory sequences and the insertion of multiple copies
- Optimizing codon usage

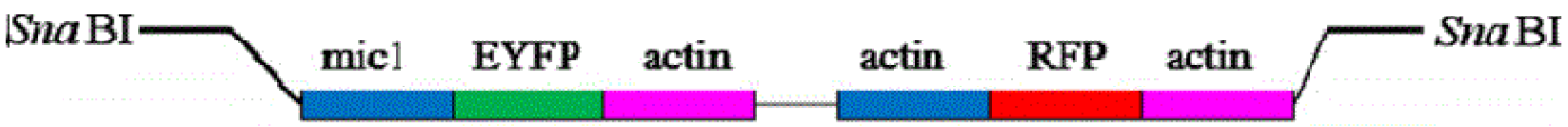


The stage for introducing DNA into *Eimeria* is the sporozoite stage

Development of transgenic *E. tenella* as a novel vaccine vector

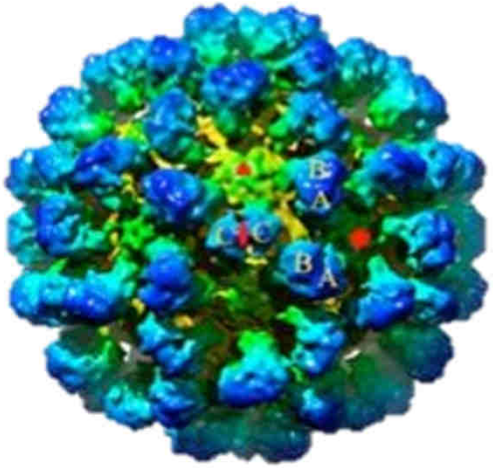
pMIC-EYFP/ACT-RFP

(Yin et al., 2011)



pMICEYFP/ACTss-RFP

Rabbit hemorrhagic disease virus (RHDV)



RHDV

RNA virus

Positive-sense (+) single-stranded

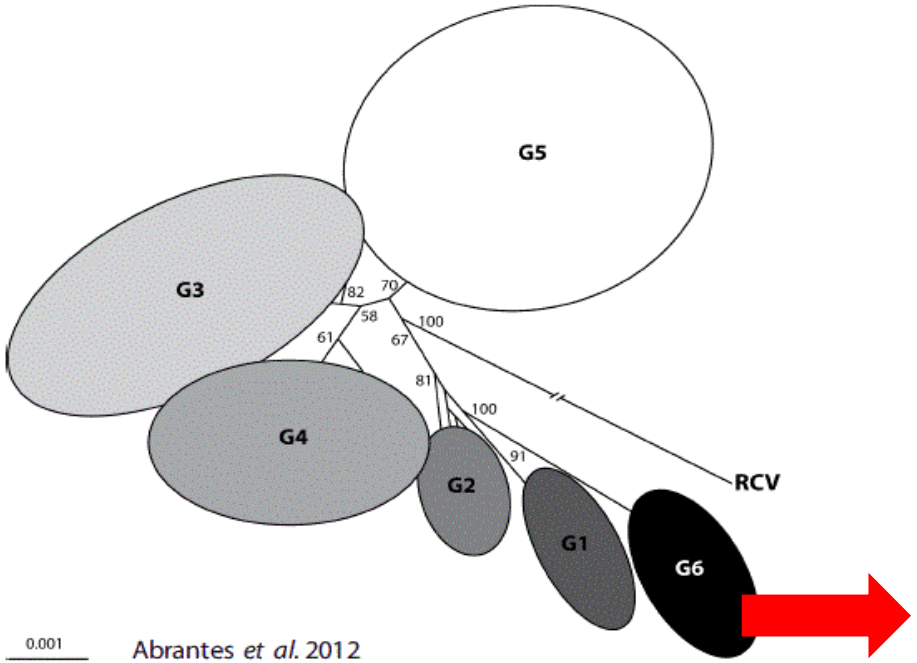
Genome size 7.5 kb

RHDV → **G1-G6**

Mortality 70–90%

RHDV2 (2010)

Mortality 5–70%



RHDVa

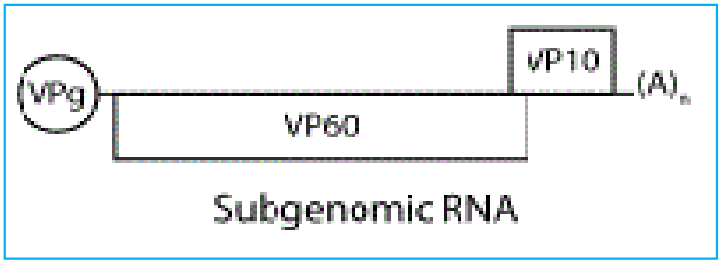
Strategies for the control of Rabbit hemorrhagic disease (RHD)

No drugs!

Traditional vaccine produced from tissue suspensions

Recombinant DNA technology for the control of RHD

Recombinant DNA vaccines



PPV-NK VP60 chimera

BAC-VP60 *(Suo et al., 2016)*

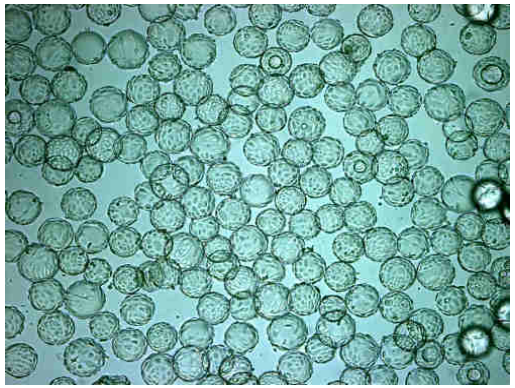
Recombinant myxomavirus

Rabbit Haemorrhagic Disease Virus Baculovirus Vector Vaccine (BAC-VP60)

Recombinant plasmid
Bacmid –VP60

Transfection

Sf9 cells



Harvest

Inactivation

CH_2O
(Formaldehyde)

Inoculation

- ❑ No change in rabbits' general conditions
- ❑ Good protection against RHDV
- ❑ Protective immunity within 7 days
- ❑ Protection up to 7 months

Oral presentation

CIRCULATION OF DIFFERENT STRAINS OF RABBIT HEMORRHAGIC DISEASE VIRUS (RHDV) IN SOUTHERN ITALY: CLINICAL AND EPIDEMIOLOGICAL FINDINGS

Marino M.[1] Pugliese N.[1], Circella E.[1], Cocciolo G.[1], Papapicco C.[1], Tondo A.[1], Romito D.[1], D'Onghia F.[1], Camarda A.[1]*

[1]Department. of Veterinary Medicine, University of Bari "Aldo Moro", S.P. per Casamassima Km 3, 70010, Valenzano (Bari), Italy
*Corresponding author: antonio.camarda@uniba.it

Pathology and Hygiene

A THREE-YEAR PROSPECTIVE STUDY SHOWS CLONAL SPREADING OF t5210 ST398 MRSA IN RABBITS AND FARM WORKERS OF ONE INDUSTRIAL FARM

Brunetta R.[1] Mazzolini E.[1], Bano L.[1], Berto G.[1], Guolo A.[1], Ferro T.[1], Puiatti C.[1], Rigoli R.[2], Tonon E.[1], Zandonà L.[1], Drigo I.[1], Agnoletti F.[1]

[1] Istituto Zooprofilattico Sperimentale delle Venezie, via dell'Università 10, 35020 Legnaro (PD), Italy
[2] Dipartimento di Patologia Clinica, Ospedale Santa Maria di Cà Foncello, 31100 Treviso, Italy
*Corresponding author: fagnoletti @izsvenezie.it

Pathology and Hygiene

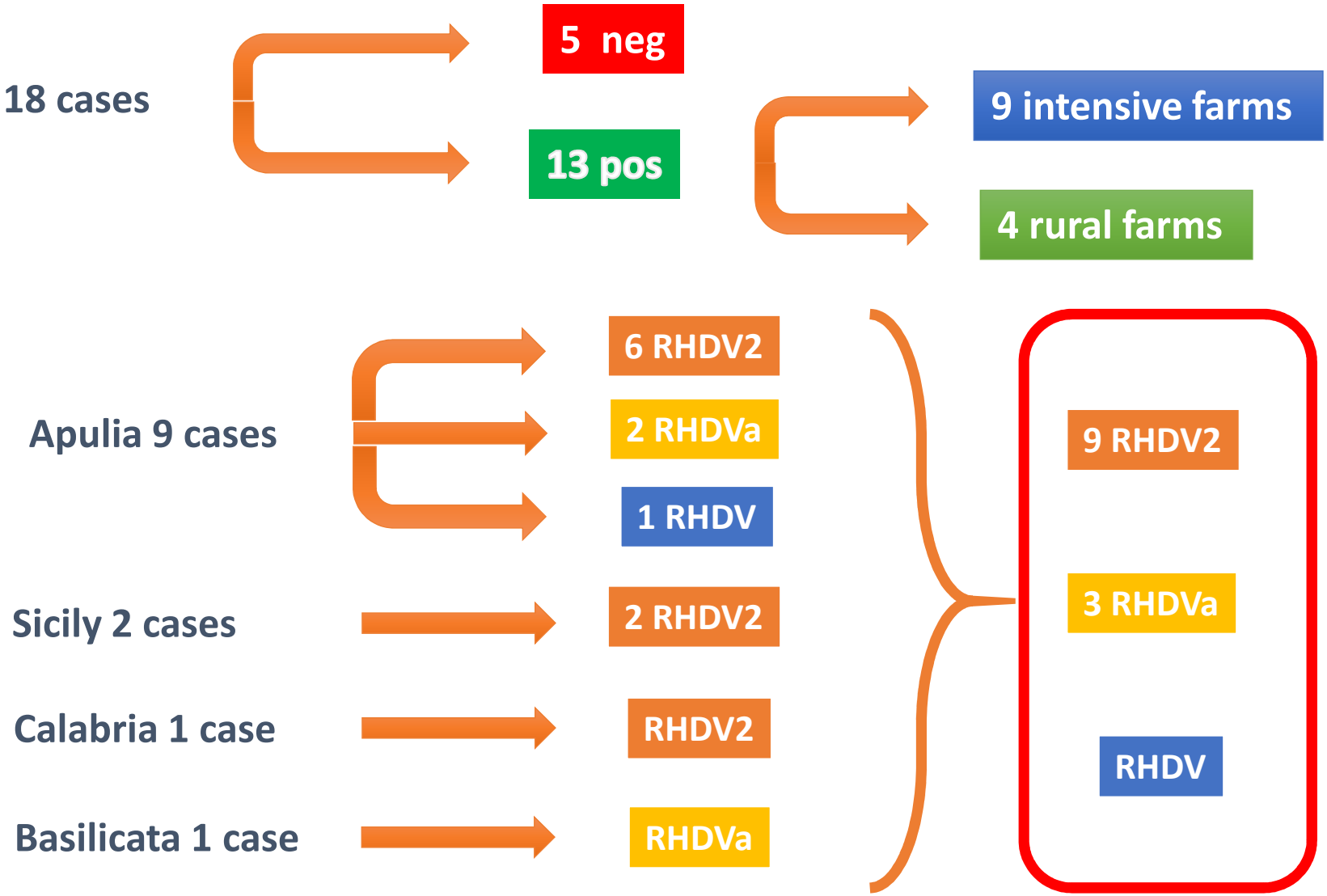
EFFICACY AND SAFETY OF A NEW INACTIVATED VACCINE AGAINST THE RABBIT HAEMORRHAGIC DISEASE VIRUS 2-LIKE VARIANT (RHDV-2)

Montbrau C.[1+], Padrell M.[1+]*, Ruiz M.C.[1+]

[1]HIPRA, Av. de la Selva 135, 17170, Amer, Spain
[+]Equal contribution to this work
*Corresponding author: maria.padrell@hipra.com,

Marino et al., 2016

The aim: Evaluate the spread of RHDV2 in South Italy, in three years period (2013-2015) and genetic characterization RHDV strains



Marino et al., 2016

Rapid diffusion of RHDV2 in rabbit farms

Presence of the infection in wild animals

Wild rabbits could play a role of reservoir

Vaccine RHDV2 strains should be based on strains very similar to the field isolates

Brunetta et al., 2016

The aim: The study the within-herd epidemiology and the exposure of farm workers and their families to MRSA by this food-producing animal

Sampling month	Rabbits tested (N.)	Rabbits *S. aureus* carriage (%)	MRSA carrier rabbits (N.)	MRSA rabbit carrier among *S. aureus* carriage	MRSA molecular typing results				
					MRSA isolates typed	N.	*Spa* type	MLST type (ST)	LA-MRSA (%)
0	25	23 (92%)	12	52%	3	1	t5210	398	66%
						1	t034	398	
						1	t121	159	
5th	60	59 (98%)	15	25%	15	7	t034	398	66%
						3	t5210	398	
						2	t1190	Not found	
						2	t2970	Not found	
						1	t159	121	
12th	60	32 (53%)	32	100%	23	16	t5210	398	100%
						7	t13617	398	
33rd	60	56 (93%)	56	100%	28	25	t5210	398	100%
						1	t011	398	
						1	t034	398	
						1	t15492	398	

MRSA = *Staphylococcus aureus* (*S. aureus*) methicillin resistant

LA-MRSA = livestock associated MRSA

MLST = multi locus sequence typing

Brunetta et al., 2016

MRSA was detected in all six farm workers

The rabbit intensivesystem may be considered among the herds that increase the burden of exposure of humans to LA - MRSA

t5210

High capability to contaminate humans directly exposed, by the holding environment and animals, and indirectly by means of family connections

Posters

RHD

4 Posters

China 3 – 1 Spain

Epidemiology

Temporal evolution of rabbit haemorrhagic disease virus (RHDV) and impact of vaccination during the RHD epidemic in Spain 2013-2015. *Valls L., Sánchez-Matamoros A., Padrell M.1, Maldonado J.*

Prevalence of pathogenic viruses within Ontario commercial meat rabbits. *X.T. Xie, J. Bil, E. Shantz, J. Hammermueller, P.V. Turner.*

Posters

Vaccines implementation

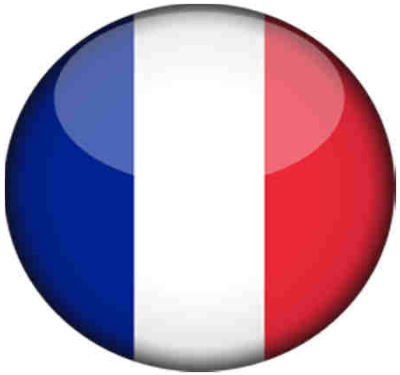
Identification of two new immun-protective candidates proteins for the development of *Bordetella bronchiseptica* subunit vaccine. *Liu Y., Chen H., Qin FY.,Wei Q., Xiao CW., Ji QA, Bao GL.*

Protection of rabbits against coccidiosis by co-infection with *Eimeria magna*, *E. intestinalis* and *E. media*. *Wang Y., Tao G., Li C., Gu X., Suo X., Liu X.*

Production, characterization, and epitope mapping of monoclonal antibodies against different subtypes of rabbit hemorrhagic disease virus (RHDV). *Liu J., Kong D., Jiang Q., Yu Z., Hu X., Guo D.*, *Huang Q., Jiao M., Qu L.*

Interaction of novel RHDV B-cell epitopes with HBGA. *Song Y., Wang F., Fan Z., Hu B., Liu X., Wei H., Xue J., Qiu R.*

Posters



Therapies

Interest and limits of adding exogenous hard feces in the nest box on the rabbit performances and health before and after weaning. ***Shi D., Savietto D., Prigent A.Y., Gidenne T., Colin M., Combes S., Zemb O., Fortun-Lamothe L.***

Case report

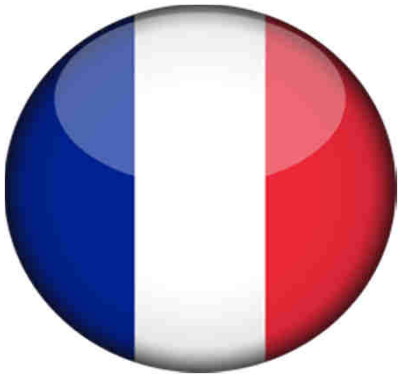
Coenurosis in a wild rabbit. Case report. ***Valladares CB, Zamora EJL; Ortega SC; Felipe-Pérez YE; Castro MJ; Velázquez OV; Alonso FMU; Sánchez TJE; Gutiérrez CA; Reyes RNE; Zaragoza BA; Aparicio BJE.***

News

A new variant of rabbit hemorrhagic disease virus g2 strain isolated in China. ***Hu B., Fan Z.Y., Wang F., Song Y.H., Wei H.J., Liu X., Qiu R.L., XuW.Z., Yuan W.Z., Xue J.B.***

Posters

Pathology and Hygiene associated with rabbits management



Study of the healing of rabbit farms umbilics (*Oryctolagus cuniculus*) newborns. *Boucher S. Plassiart G., Bignon L.*

Possible deleterious effects of excess of vitamin E in rabbit performance and health before and after weaning. *Zarraa S., Colin M., Prigent A.Y., Shi D.*

Are pre-weaning health problems transferred to later phases in PARC housed meat rabbits? *Rommers J.M. and de Greef K.H.*

Ulcerative pododermatitis on a rex rabbit farm, Spain, 2005-2015. *Garcia, J., Rosell, J.M.*

感谢您的关注

(Grazie per l’attenzione)