

Ladies & gentlemen, attendees to the congress & listeners, welcome

To this round table:

"The rabbit farming in the post-antibiotic era: a challenge that can be won?"



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Introduced and moderated
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I am Joan Rosell. First, I want to thank the World Rabbit Congress organizers, particularly to Dr. Thierry Gidenne!



"The rabbit farming in the post-antibiotic era: a challenge that can be won?"



I have come here, also because I am indebted to:



Monsieur Lebas

To many of you



Merci!



a lot of rabbit producers,
gracias, obrigado!



Bedankt

I try to return what they have taught me, if possible improving it!

That is what I am at: working for farmed rabbits.

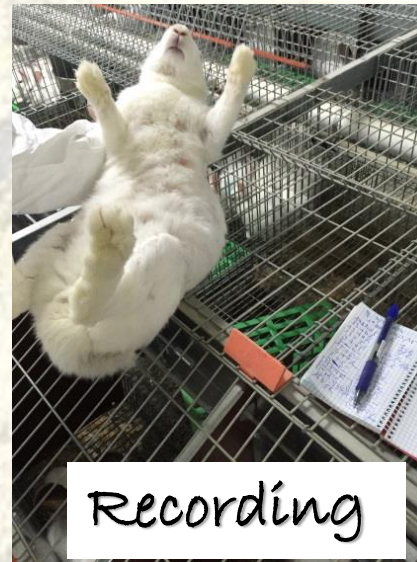


Here you have two extreme examples of visited farms: a rural one with 35 females and a commercial rabbitry with > 35,000 rabbit does.



"The rabbit farming in the post-antibiotic era: a challenge that can be won?"

Our on-farm work protocol has a key step: the diagnosis.



On-farm work protocol includes a close relationship with analysis laboratories.



They are a source of progress
(knowledge) for us and our clients

Our work on rabbit meat production has priorities such as: the Health of rabbits (in a degree compatible with production), as a basic component of welfare, with Public Health, the Environment and lastly, the economics of the rabbit producers.



With prescription



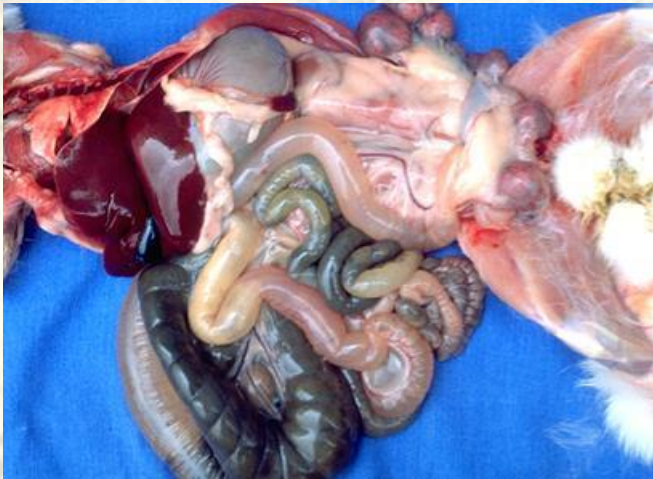
These are core aspects in the EU-27 and in other countries, for sure.



Inspection

Retrospective study of my visits (inside) to rabbit farms:

During 1996 to 2020: 4.712 urgent visits (42.6% of the total visits) to 1,040 farms (ES, P). Until 2007: 51.5% due to digestive system, in adults, in young rabbits or both. Mucoïd enteropathy (similar to epizootic rabbit enteropathy/ ERE), was the most relevant process, followed by enteritis-diarrhea (due to enterobacteria, especially caused by *Escherichia coli* or clostridia, and coccidia). From 2008 onwards the occurrence dropped to 23% of urgencies, of which 30% were due to digestive.



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Diseases of the digest system of farmed rabbits

Several authors highlighted the complexity of digestive processes: they are often pluriétiological. For example:

Peeters, J.E., Pohl, P., Charlier, G. 1984. Infectious agents associated with diarrhea in commercial rabbits: A field study. *Ann. Rech. Vet.* 15:24-29.

Agnoletti, F. 2012. Update on rabbit enteric diseases: despite improved diagnostic capacity, where does control and prevention stand? In 10th World Rabbit Congress - September 3 - 6, 2012- Sharm El- Sheikh - Egypt, 1113- 1127.

Solans, L., Arnal, J.L., Sanz, C., Benito, A., Chacón, G., Alzaguren, O., Fernández, A.B. 2019. Rabbit Enteropathies on Commercial Farms in the Iberian Peninsula: Etiological Agents Identified in 2018-2019. *Animals*, 9, 1142-1152. Doi:10.3390/ani9121142.

Among other authors



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The work of veterinarians attending rabbit farms, in relation with Public Health

Special mention should be made of diseases common to humans and rabbits (zoonoses), mainly salmonellosis and ringworms.

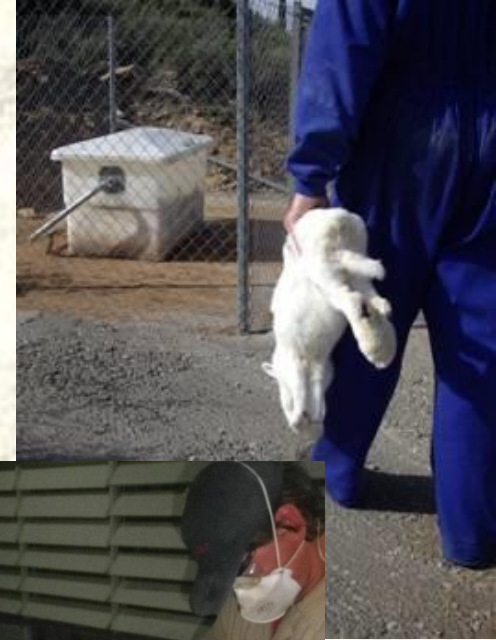
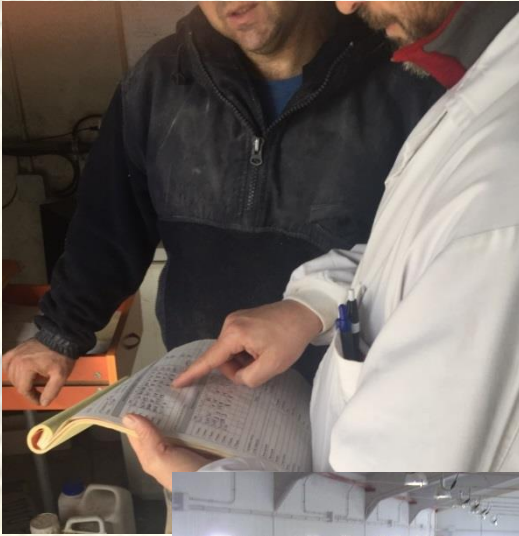


From 1997 to 2011 we found 4% of positive farms (900 visited).



Concerning ringworm, the occurrence was higher

The control of these diseases is based on the diagnosis, prevention measures (e.g., culling, autologous vaccine, disinfection, and so on), and the treatment.



Josep TERRADES, often remembered me that "in rabbit production almost everything is debatable"

Please, keep this thought in mind, today in my introduction to this round table.

Also later, when you look for your own conclusions and action plans, on the subject of this round table.



However, there are several exceptions (few doubtful):

People rearing rabbits should respect (love) them.

The farm staff need to have the sense of approach, to interpret behaviour and clinical signs. Rabbit lives quickly!

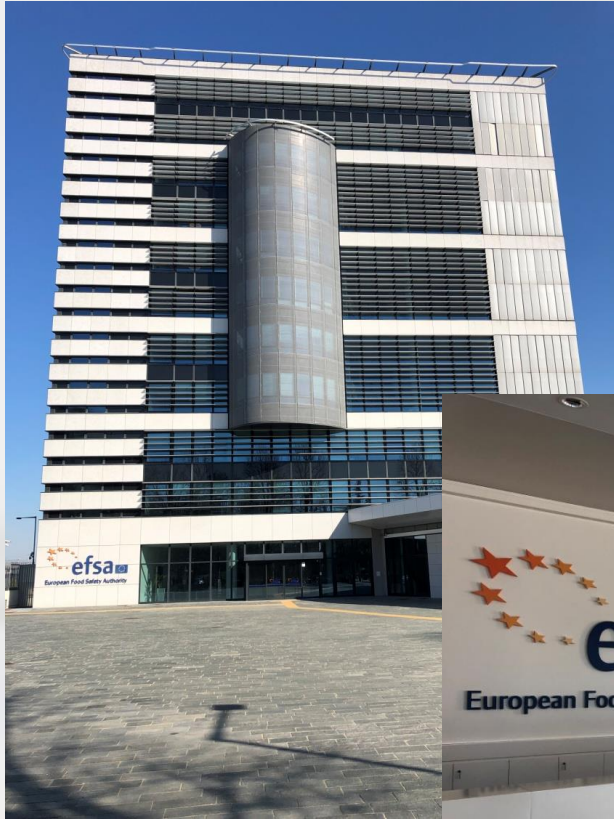
Hygiene is always useful (without obsession, such disinfecting twice a day in absence of myxomatosis or similar).

These axioms are related to rabbit health and the lower use of antimicrobials, for sure!

Am I being clear?



I have had other references for this presentation; e.g., my collaboration with experts of the European Food Safety Authority (during 2004-2005, 2018-2019, and 2021).



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JM

EFSA publishes information based on scientific evidences, and eventually supported by external experts.

For instance, the scientific opinion:

"Assessment of animal diseases caused by bacteria resistant to antimicrobials:

Rabbits", that will be published these days, by the EFSA Panel on Animal Health and Welfare (AHAW)



Public sources of information in regard to antimicrobial resistance (AMR) in farmed rabbits are available. For example, in France: <https://resapath.anses.fr> or in Italy: <https://www.izsvenezie.it> among others.

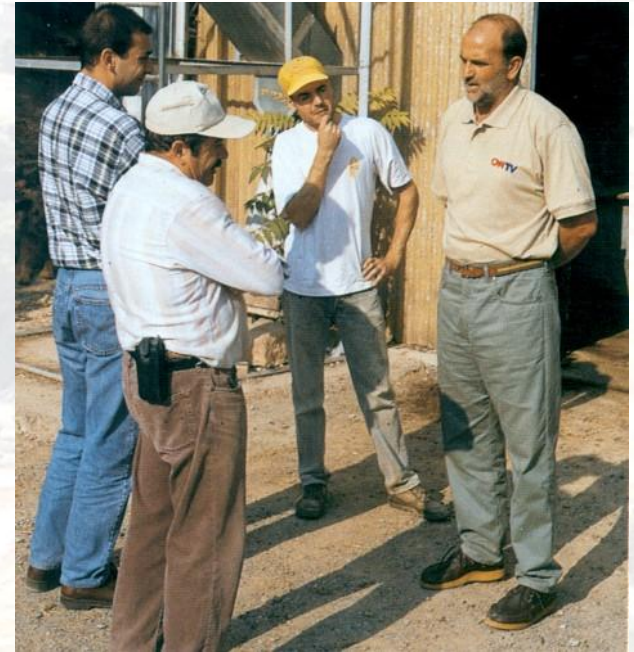
Concerning the subject: "Reduction of the use of antimicrobials in rabbit farming" (which is different from "the decline in medical care for rabbits", of course!)

There is a lot of information, and it is necessary that professionals invest time in the study, have criteria and exercise self-criticism.



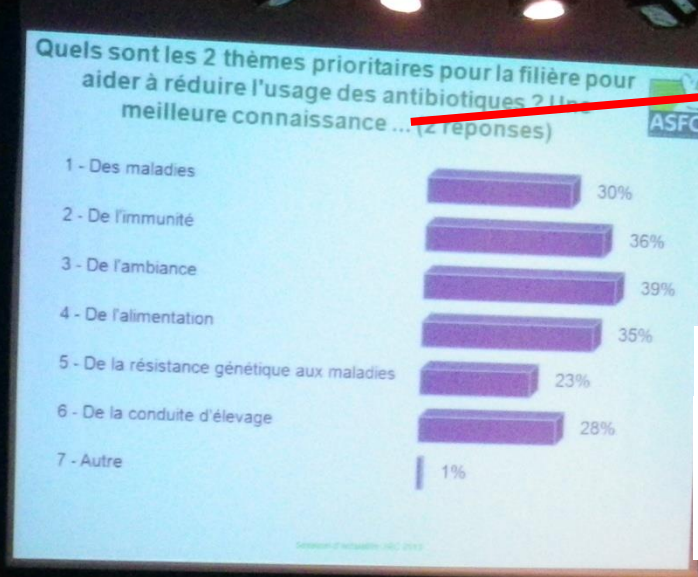
Uncertainty is normal when faced with unknown jobs, investments, or both.

For example: reduction in the use of antimicrobials, increasing effort in Biosecurity, placing one footrest for each breeding rabbit, restriction of food, weighing animals, lower post-weaning density, use of extensive rhythms of reproduction, more communication with technicians and lastly, higher costs.



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Many people have worked to reduce the use of the antimicrobials on rabbit farming; e.g., in France



We need to know better:

Rabbit diseases: 30%

Immunity: 36%

Environment: 39%

Feeding: 35%

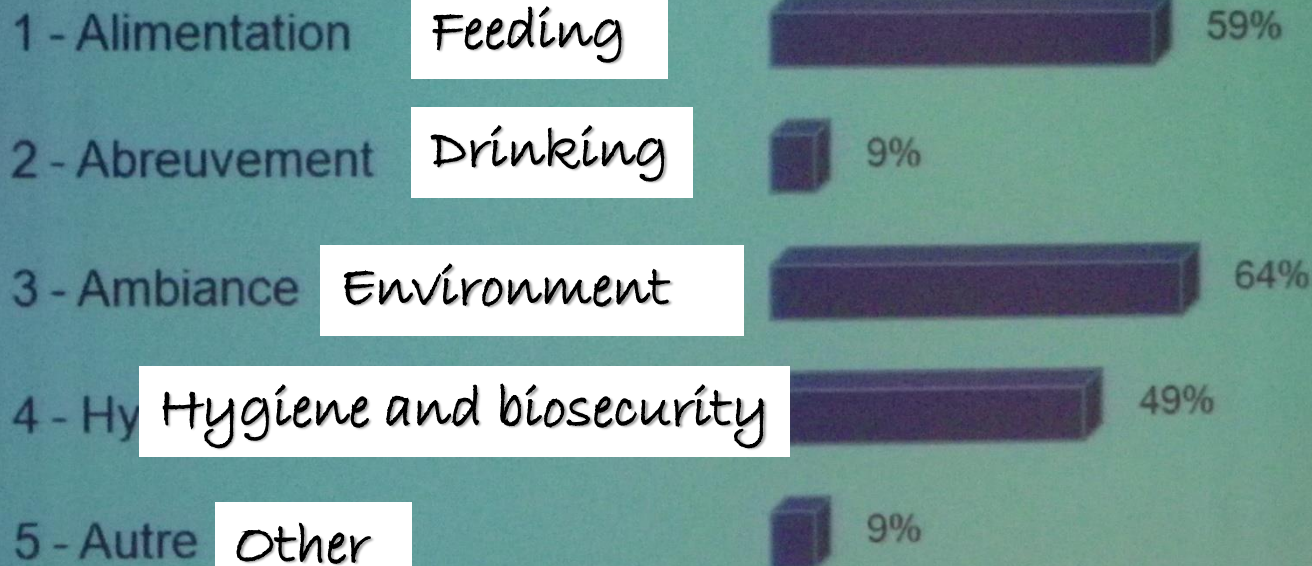
Genetic resistance to disease: 23%

Management: 28%

Journées de la Recherche Cunicole 2013

"In the field, what are the 2 technical key factors that you work first to reduce the use of antimicrobials?"

Sur le terrain, quels sont les 2 leviers techniques que vous travaillez en premier pour réduire l'emploi des antibiotiques ? (2 réponses)



Journées de la Recherche Cunicole 2013



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There is a key aspect, question, or a cliché:
«The rabbit is susceptible to diseases ? (!)»

François Lebas, made it clear in 2000 (*The Biology of the Rabbit*, in: www.cuniculture.info): the rabbit is an animal that lives quickly; but it is no more "delicate" (eg, in terms of viability), than pigs, which are not especially "delicate."



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Therefore, it is evident that the farm staff or technicians who visit rabbit farms must have the sense of approach.



And react quickly

The reduction in the use of antimicrobials must be based on the lower occurrence of diseases, right?



There are factors (of production...or risk) that you know and I will remind you...



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Production factors/ risk factor's

Housing

Predisposing factors of disease

Enabling risk factor's

Genetics

The line, age, sex..

Feeding

... the physiological state,
and the body condition...

Manegement

Biosecurity



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CALLE
PROFESOR
RO CARMENES



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In my opinion the 1st risk factor is related with environment. A key aspect is air speed (plus temperature and relative humidity). Producers have more rabbits than before. They work harder, "have heat" and have "less time" to think about the possible adverse effect of the environment on their animals.



Control is time consuming and not easy.

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More aspects related to housing...

The separation of the rabbits from their droppings was the first link of sanitary improvement; or the second, after the sanitation of the drinking water.



The footrests for adults. In 2000, 25% of producers implemented plastic mats in each individual housing; in 2019 it was 87,7%. This accessory decrease the occurrence of ulcerative pododermatitis and the use of topic treatments.



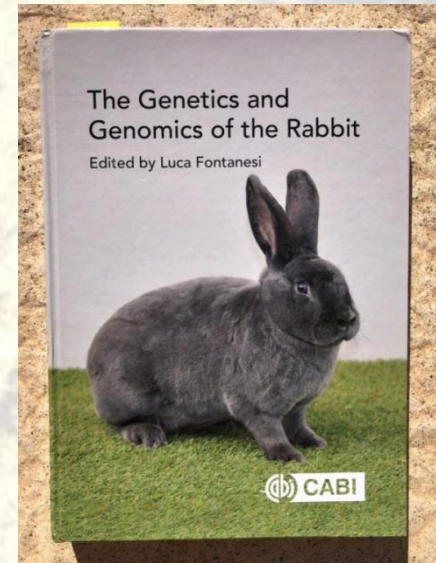
Density of weaned rabbits is a clear production or risk factor (contagions, infections, fights, injuries, and viability).



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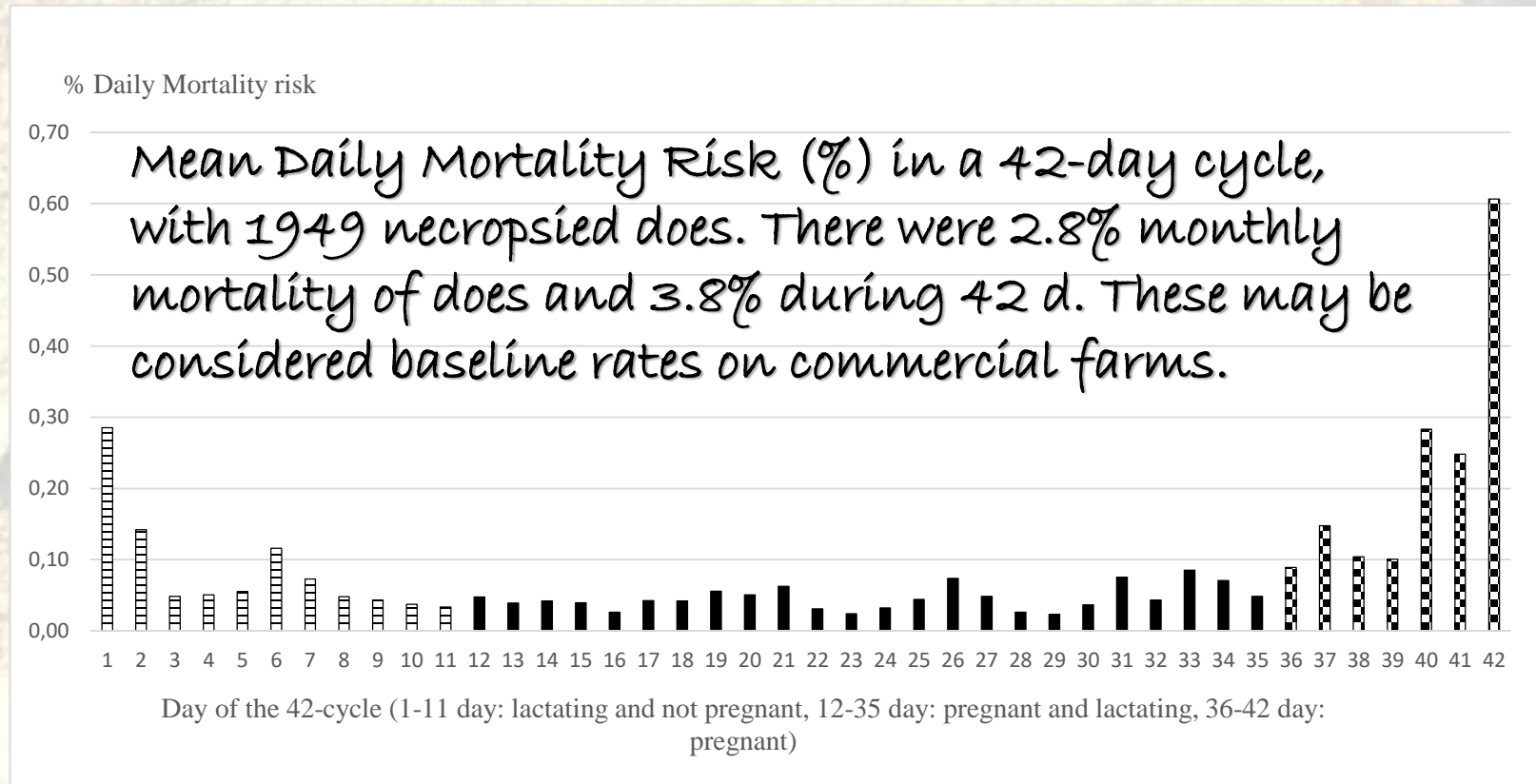
Genetics: the rabbit line, sex, age and physiological state of females might be predisposing risk factor's disease

For example, line and mastitis: 144,455 rabbit females physically examined on 490 farms in Spain and 41 farms in Portugal from 2001 to 2017. Mean prevalence of clinical mastitis was 4% (2.05% in the lowest, and PCM = 4.83% in the line most likely to have mastitis, $p < 0.05$). Rosell JM and de la Fuente, LF, 2018. Mastitis on rabbit farms. *Animals journal*.



Females are more predisposed to have hepatic lipídosis than males. Newborn rabbits are more susceptible to staphylococcosis than adults. Weanlings are stressed. Lactating does are more predisposed to mucoid enteropathy than non-lactating does.

The physiological status might be a predisposing risk factor's of disease. For instance, concerning does:



Rosell J.M. and de la Fuente, L.F. 2016. Preventive Veterinary Medicine. 490 doe farms studied



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Genetics and management: rearing of young does:
a golden rule of the farm.

I remind you of the names of some authors who have worked on this core aspect of rabbit farming, such as:

Rommers 1999, Marai 2010, McNitt *et al*
(Rabbit Production 9th ed), Schlolaut 2013,
and Martínez Paredes 2019, among others.



Housing (individually from 3 months onwards or together), the kind of crossbreeding, food management (restricted until 4 days before the 1st service), vaccination, culling (for example, due to bad health or after a weight control), treatment (by injection) before first AI or during first pregnancy, and so on.

I wonder if nature accepts rabbits as big as ponies!

Feeding: the food and their on-farm management

The hygienic characteristics of feed and water, and their on-farm management, might be a source of progress or a sanitary setback. Currently it is a core subject.



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Feeding (the food and their on-farm management), might be source of success or damage to rabbits.

The practical feeding has evolved a lot. Progress has been made in the use of raw materials, types of nutrients, evaluation and content in a formula. To this end, the papers of De Blas, J.C. (2013, *Animal*) and Gidenne, T. et al., 2019 (*INRA Prod. Anim.*), among others, will be useful to have perspective.



Implementing prebiotics and probiotics in the feed or water are of certain interest; e.g. against enterobacteria (mainly *E. coli* and *Salmonella* spp.). That includes oils, acidifiers, clays, beta-galactomannan, and also microorganisms, respectively.



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Other aspects of on-farm rabbit management influencing production or enabling disorders.

The rhythm of reproduction. In Spain, 70% of producers used service at 11 days after kindling; in France it was >90%.

Females can be served at 11-18-25-32-39-45- even 60 days after parturition (I visit one farm in the last case, with 1800 does on single batch, after 2018).

We have observed that with the service from 32 days onwards, fertility increases (2020, *Animals journal*). The body condition score and sanitary status of doe rabbit also improve (work in progress, concerning respiratory diseases, studied from 1996 until 2020).



Hygiene and Biosecurity in rabbit farming

Our challenge is to boost the immune system, not to break it.

Staphylococcus aureus and Pasteurella multocida are opportunistic pathogens!

Transition females are more susceptible to diseases

High cold air speed, and sudden changes of temperat. ($>6^{\circ}\text{C}/\text{h}$) affect the immune system.

We have to encourage Administrations and scientists to research about the rabbit immune system.

Lastly...



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One more reflection: if we are thinking about the future of rabbit farming...

When I am with them...



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Thank you for your attention!
Now it's your turn!



Juan María ROSELL PUJOL



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