



 **World  
Rabbit  
Congress**  
*2016*  
*Qingdao, China*



# Convegno ASIC 2016

## 11<sup>th</sup> WRC: Inviati speciali in Cina

30 settembre 2016, Padova

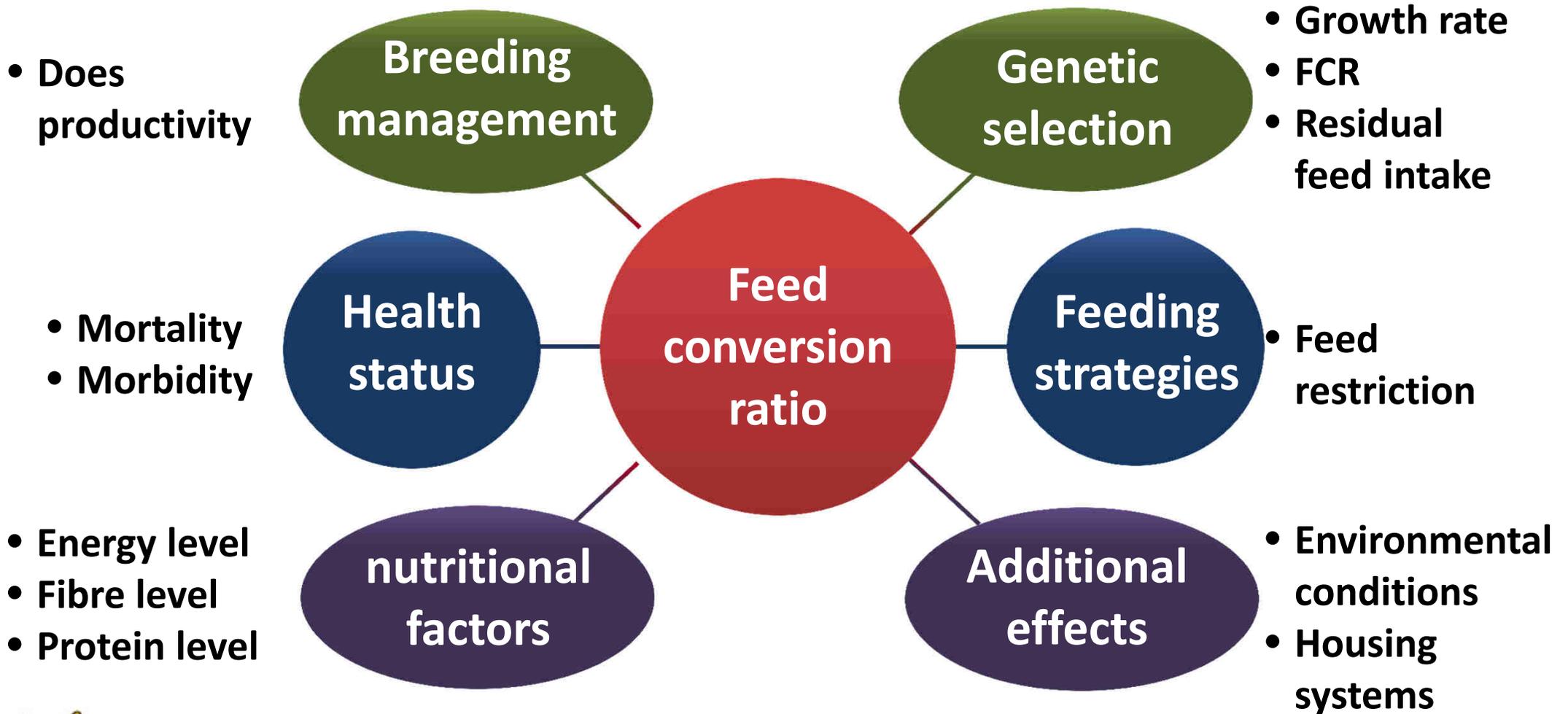




# Main paper:

## FEED EFFICIENCY IN RABBIT PRODUCTION: NUTRITIONAL, TECHNICO-ECONOMICAL AND ENVIRONMENTAL ASPECTS

Maertens L.<sup>1</sup>, Gidenne T.<sup>2\*</sup>



# Farm feed conversion according to the reproduction efficiency and fattening mortality

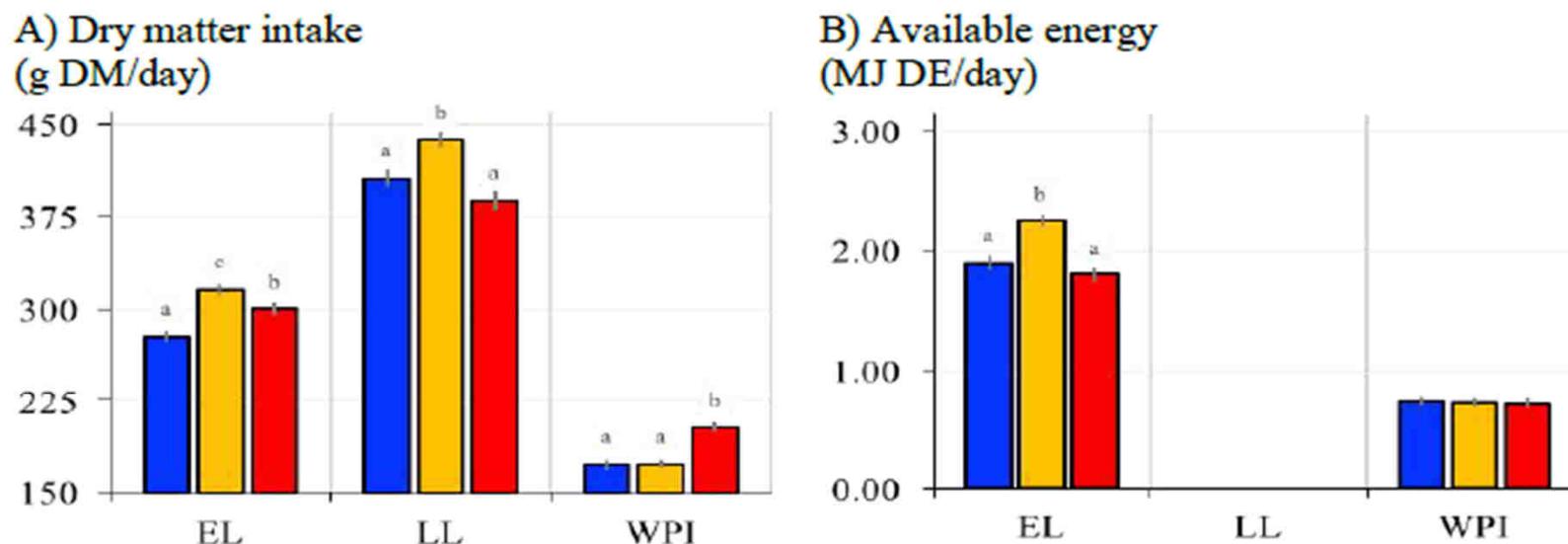
Losses in the Fattening unit (%)	N° of weaned young/doe/year		
	62	57	52
0	2.79	3.03	3.31
5	2.93	3.27	3.59
10	3.09	3.45	3.79
15	3.27	3.66	4.01

*Maertens and Gidenne, 2016*



# FEED INTAKE IN REPRODUCTIVE RABBIT DOES: ANIMAL'S VIEW

Arnau-Bonachera A.<sup>1\*</sup>, Baselga M.<sup>1</sup>, Pascual J.J.<sup>1</sup>



**Figure 1.** Dry matter (DM) intake (A) and digestible energy (DE) intake minus energy for maintenance (B) of rabbit does at different moments of the reproductive cycle depending on the genetic type (Blue: line H, Golden: line LP and Red: line R). EL: Early lactation, LL: Late lactation (doe + litter), WPI: Weaning to parturition interval. Means in a time control not sharing letter significantly differ at  $P < 0.05$ .

- **Hyper-functional long-lived criterion could be the more realistic solution to obtain animals able to adapt their energy intake according to their transitory requirements**



# Nutritional factors affecting FCR in growing rabbits: dietary energy and fibres concentration

- ✓ **Increasing digestible energy intake or reducing ADF concentration, FCR linearly decreases**
- ✓ **Rapidly fermentable fibers can replace a portion of starch without compromising growth performance**
- ✓ **If the fibre requirements are met, the dietary energy concentration can be increased by replacing starch with fat, thus obtaining a significant improvement on the FCR**

*Maertens and Gidenne, 2016*



# Nutritional factors affecting FCR in growing rabbits: protein supply

- ✓ The protein intake has weak effects on FCR when the required intake of essential amino acids is met
- ✓ DP to DE ratios between 9,5 and 11,0 g DP/MJ DE are recommended for optimal growth rate
- ✓ High DP to DE ratios could impair rabbits' health status and FCR
- ✓ The use of finishing diets with high DE levels and moderate DP content can be useful to reduce nitrogen excretion and improve FCR

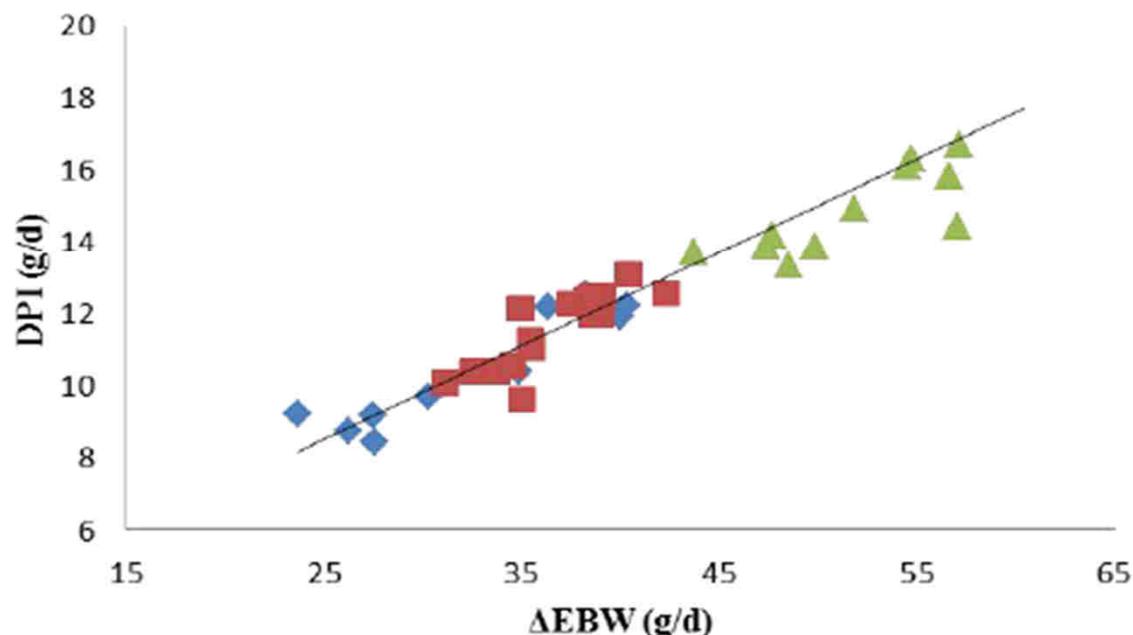


*Maertens and Gidenne, 2016*

*Convegno ASIC 2016, Padova, September 30 2016*

# ARE GROWING DIETS PROVIDING ENOUGH PROTEIN TO HIGH GROWTH RATE RABBITS?

Marín-García, P.J.\*, Ródenas L., Martínez-Paredes E., Blas E., Cervera C., Pascual J.J.



**Figure 3:** Relationship between digestible protein intake (DPI) and daily empty body weight gain ( $\Delta$ EBW). Genetic types: H (in blue), LP (in red) and R (in green).

- A protein deficit could occur in growing rabbits with high growth rate (>48 g/d) when moderate protein diets are used (146 g CP/kg)
- Limiting amino acids requirements should be determined in function of the growth rate to develop specific growing diets



# **EFFECT OF ENERGY LEVEL IN DOE DIET ON INTAKE AND PERFORMANCES OF YOUNG RABBITS BEFORE AND AFTER WEANING**

**Read T.<sup>1,2</sup>, Combes S.<sup>1</sup>, Gidenne T.<sup>1</sup>, Destombes N.<sup>2</sup>, Balmisse E.<sup>3</sup>, Aymard P.<sup>3</sup>, Labatut D.<sup>3</sup>, Bébin K.<sup>4</sup>, Fortun-Lamothe L.<sup>1\*</sup>**

- The fat addition in doe diet increases the milk intake of kits, which decreases their solid feed intake before weaning**
- The high milk intake before weaning shows a negative effect on health status of growing rabbits**



# EFFECT OF TYPE AND DIETARY FAT INCLUSION ON GROWING RABBIT PERFORMANCE AND NUTRIENT RETENTION FROM 34 TO 63 DAYS OF AGE

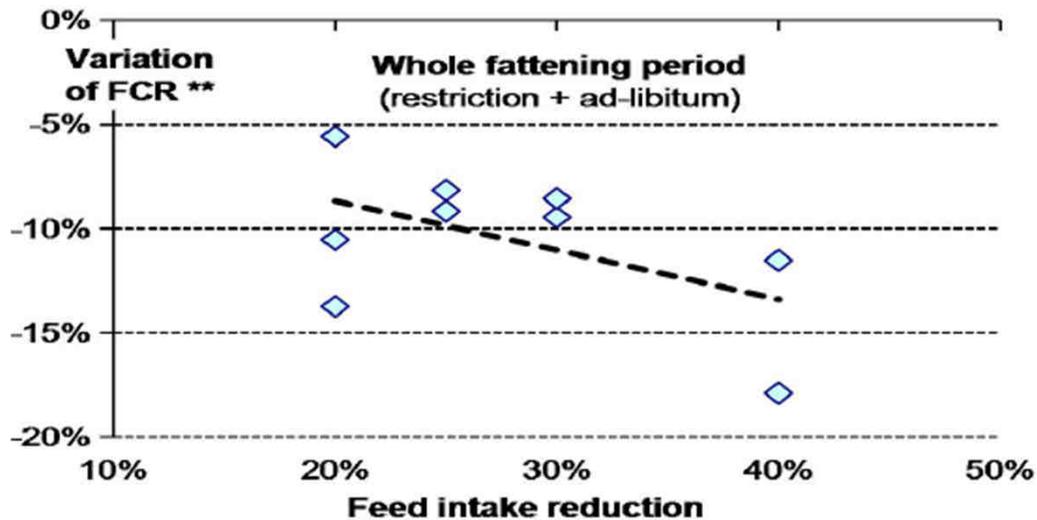
Saiz A.<sup>1\*</sup>, Nicodemus N.<sup>2</sup>, Marco M.<sup>3</sup>, Fernandez B.<sup>3</sup>, Terreros E.<sup>3</sup>, García-Ruiz A.I.<sup>1</sup>

	Source of fat					
	Soybean oil		Soya Lecithin oil		Lard	
Fat inclusion, %	1.5	4	1.5	4	1.5	4

- **Lard can be considered as an alternative source to soybean oil since it reduced the mortality, without negative effects on performances or nutrient retention**
- **An increase of the dietary fat level improves FCR and overall nitrogen retention efficiency**



# Feed restriction strategies in growing rabbits



*Maertens and Gidenne, 2016*



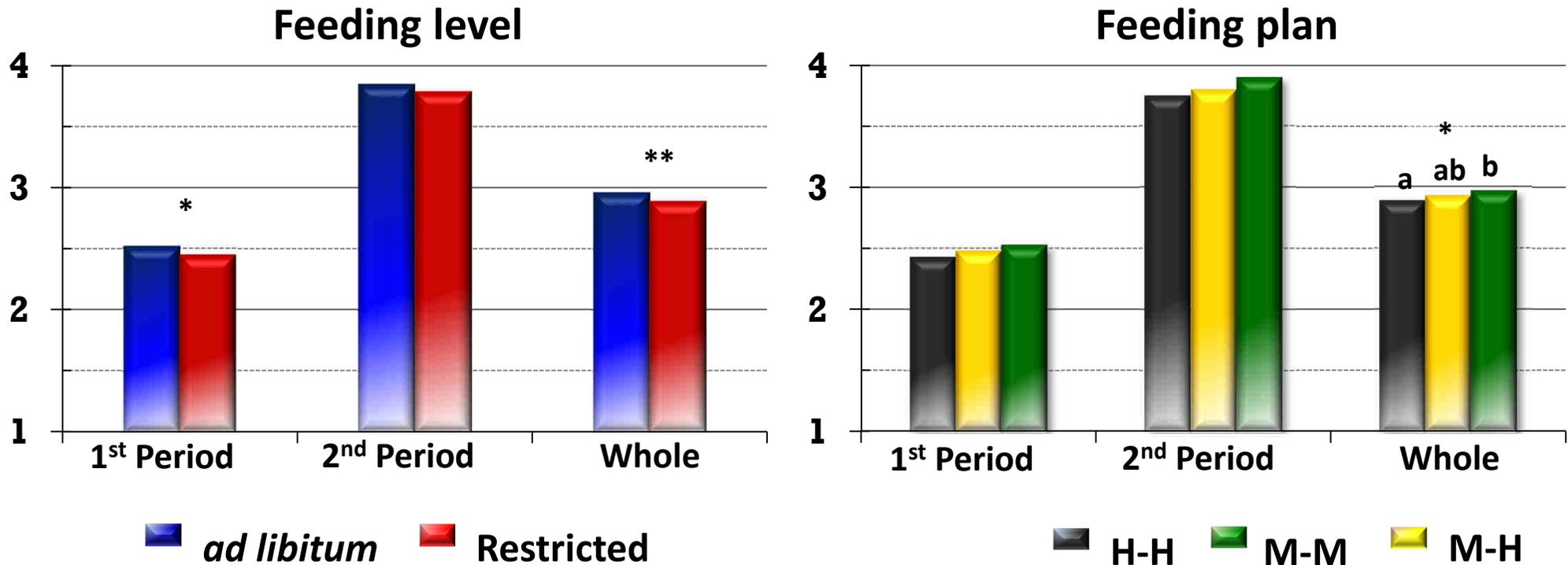
# Feed restriction strategies in growing rabbits

## EFFECT OF FEEDING PROGRAMME ON GROWTH AND BODY BALANCE OF MEAT RABBITS

Biolo M.<sup>1</sup>, Trocino A.<sup>1\*</sup>, Tazzoli M.<sup>2</sup>, Maccarana L.<sup>1</sup>, Xiccato G.<sup>2</sup>



### Feed conversion ratio



# Feed restriction strategies in growing rabbits

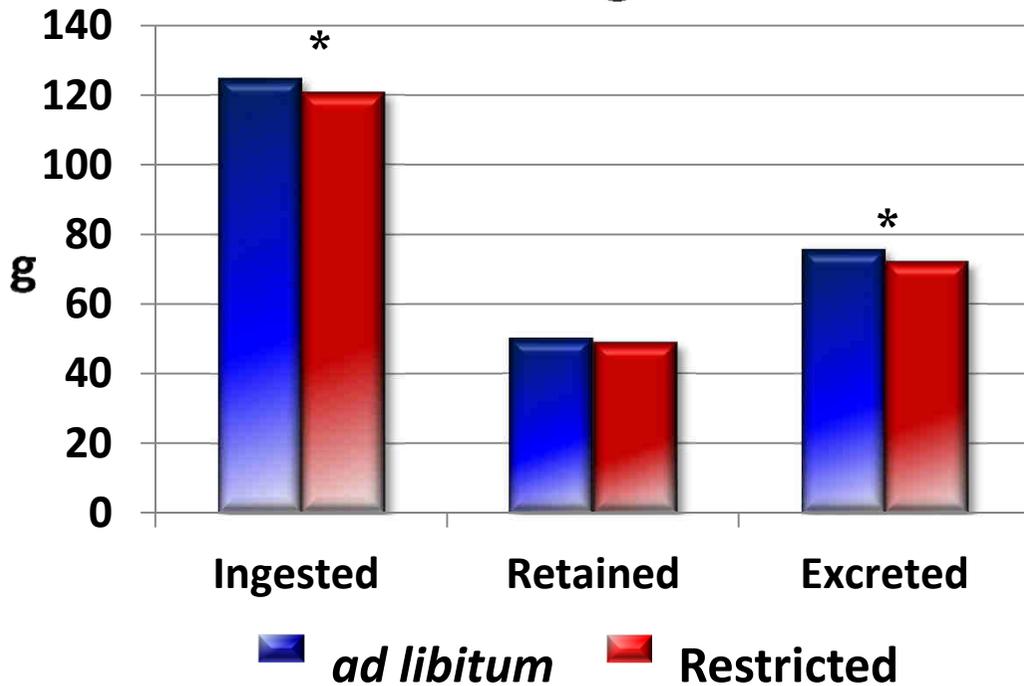
## EFFECT OF FEEDING PROGRAMME ON GROWTH AND BODY BALANCE OF MEAT RABBITS

Birolò M.<sup>1</sup>, Trocino A.<sup>1\*</sup>, Tazzoli M.<sup>2</sup>, Maccarana L.<sup>1</sup>, Xiccato G.<sup>2</sup>

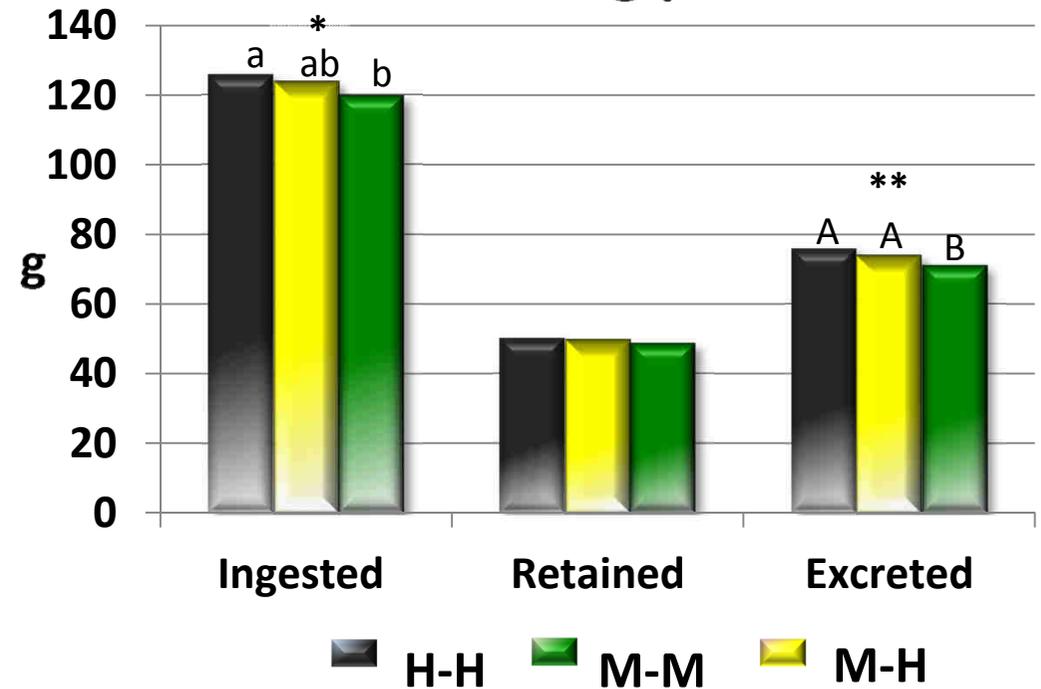


### Nitrogen balance

#### Feeding level



#### Feeding plan



# Feed restriction strategies in growing rabbits

## INTEREST OF A FASTING PERIOD TO IMPROVE GROWTH PERFORMANCES OF FATTENING RABBITS

J. Duperray<sup>1\*</sup>, E. Grand<sup>1</sup>, C. Launay<sup>1</sup>, J.M. Laurent<sup>1</sup>, R. Adelis<sup>1</sup>

*Ad libitum*

10-h day of  
fasting

R80%  
delivered  
once a day

R80%  
delivered 4  
times a day

## EFFECT OF HOUSING HYGIENE CONDITIONS AND FEED INTAKE ON SPECIFIC AND INFLAMMATORY IMMUNE RESPONSE, BACTERIAL CECAL FERMENTATION AND SURVIVAL OF RABBITS

Combes S.<sup>1\*</sup>, Massip K.<sup>1</sup>, Martin O.<sup>1,2</sup>, Furbeyre H.<sup>1,2</sup>, Balmisse E.<sup>3</sup>, Le Floch N.<sup>4</sup>, Zemb O.<sup>1</sup>, Oswald I.P.<sup>2</sup>, Gidenne T.<sup>1</sup>

## EFFECT OF FEED RESTRICTION ON GROWTH PERFORMANCE, BLOOD METABOLITES AND LIVER HORMONES IN RABBITS

Lu J.<sup>1</sup>, He Z.<sup>2</sup>, Shen Y.<sup>1</sup>, Dai X.<sup>1</sup>, Wang D.<sup>1</sup>, Zhang J.<sup>1</sup>, Li H.<sup>2\*</sup>



# Feed restriction strategies in growing rabbits: conclusions and future perspectives

- ✓ **A time feed restriction of 10-hour during the day improves feed conversion without affecting growth performances**
- ✓ **The benefits of feed restriction might be explained either by the reduction in feed intake or the presence of a fasting period during the day**
- ✓ **a moderate feed restriction (90-95% of *ad libitum* on average) can decrease feed conversion and nitrogen excretion without compromising final live weight and slaughter results**
- ✓ **Further investigations may be also carried out to prove a possible synergistic effect by combining feed restriction programs with different diet compositions**



# Alternative raw materials for rabbit nutrition

## Crude olive cake

### ➤ Good fibre source

**NUTRITIVE VALUE OF CRUDE OLIVE CAKE (*OLEA EUROPAEA* L.) FOR GROWING RABBIT**

Dorbane Z.<sup>1\*</sup>, Kadi S.A.<sup>2</sup>, Boudouma D.<sup>3</sup>, Berchiche M.<sup>2</sup>, Bannelier C.<sup>4</sup>, Gidenne T.<sup>4</sup>

## Sundried brewer's grain and maize silage

### ➤ Possible sources of energy, protein and fibre

**FEEDING VALUE OF BREWER'S GRAIN AND MAIZE SILAGE FOR RABBITS**

Guermah H.<sup>1,2\*</sup>, Maertens L.<sup>3</sup>

## Citrus pulp

### ➤ Good energy source

**RESEARCH ON NUTRION EVALUATION OF CITRUS PULP IN MEAT RABBIT**

Guo Z. Q., Lei M., Li C. Y., Ren Y. J., Kuang L. D., Zhen J., Zhang X. Y., Zhang C. X., Yang C., Xie X. H.\*

## *Quercus ilex* acorns

### ➤ Good energy source

**FEEDING *QUERCUS ILEX* ACORNS TO FATTENING RABBITS: EFFECTS ON GROWTH AND CARCASS CHARACTERISTICS**

Kadi S.A.<sup>1\*</sup>, Belaidi-Gater N.<sup>2</sup>, Djourdikh S.<sup>1</sup>, Aberkane N.<sup>1</sup>, Bannelier C.<sup>3</sup>, Gidenne T.<sup>3</sup>





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**Thank you for your attention**

*Convegno ASIC 2016, Padova, September 30 2016*

