Effects of high feeding level on caprine mammary gland development and milk yield potential

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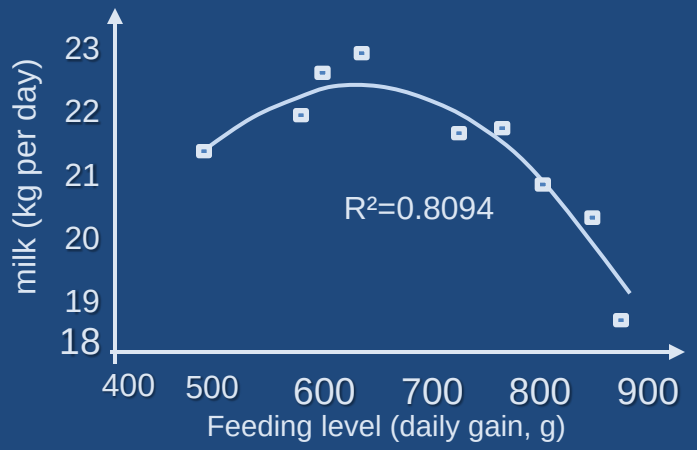
State of art in heifers

→ Previous datas from INRA and from others teams have demonstrated that rearing modifications during the prepubertal period had strong negative effects on future dairy production.

→ Every alteration of mammary gland development before puberty is fatal for the future milk production.

→ Effect of high feeding levels on subsequent milk yield have been well characterized in heifers (Sejrsen, K et al., 2000).



Effect of high feeding levels on mammary development and milk production in goats ???

Objectives of these studies

→ Studying the effects of high feeding level on:

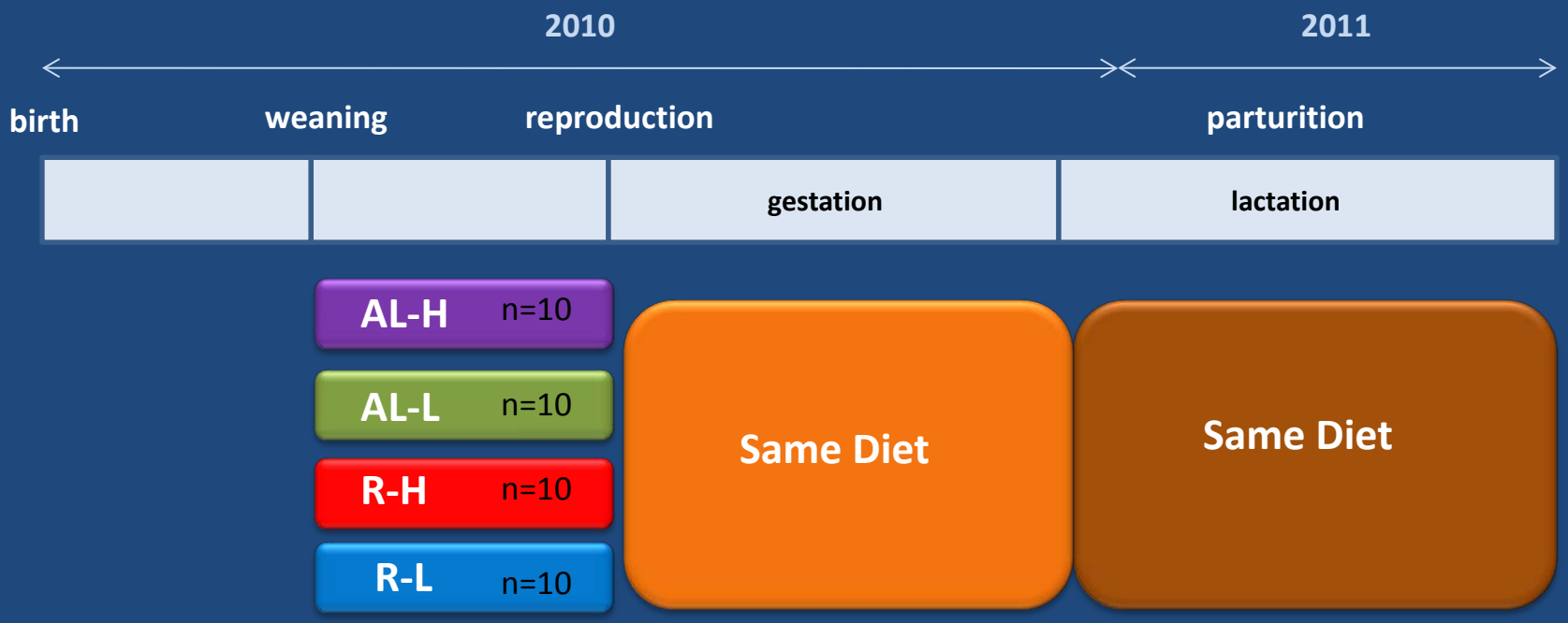
> Mammary gland development

> Mammary gland differentiation

> Milk yield potential

→ Improving goat kids management

Experimental design N°1



DIET : Concentrate + Hay-Straw

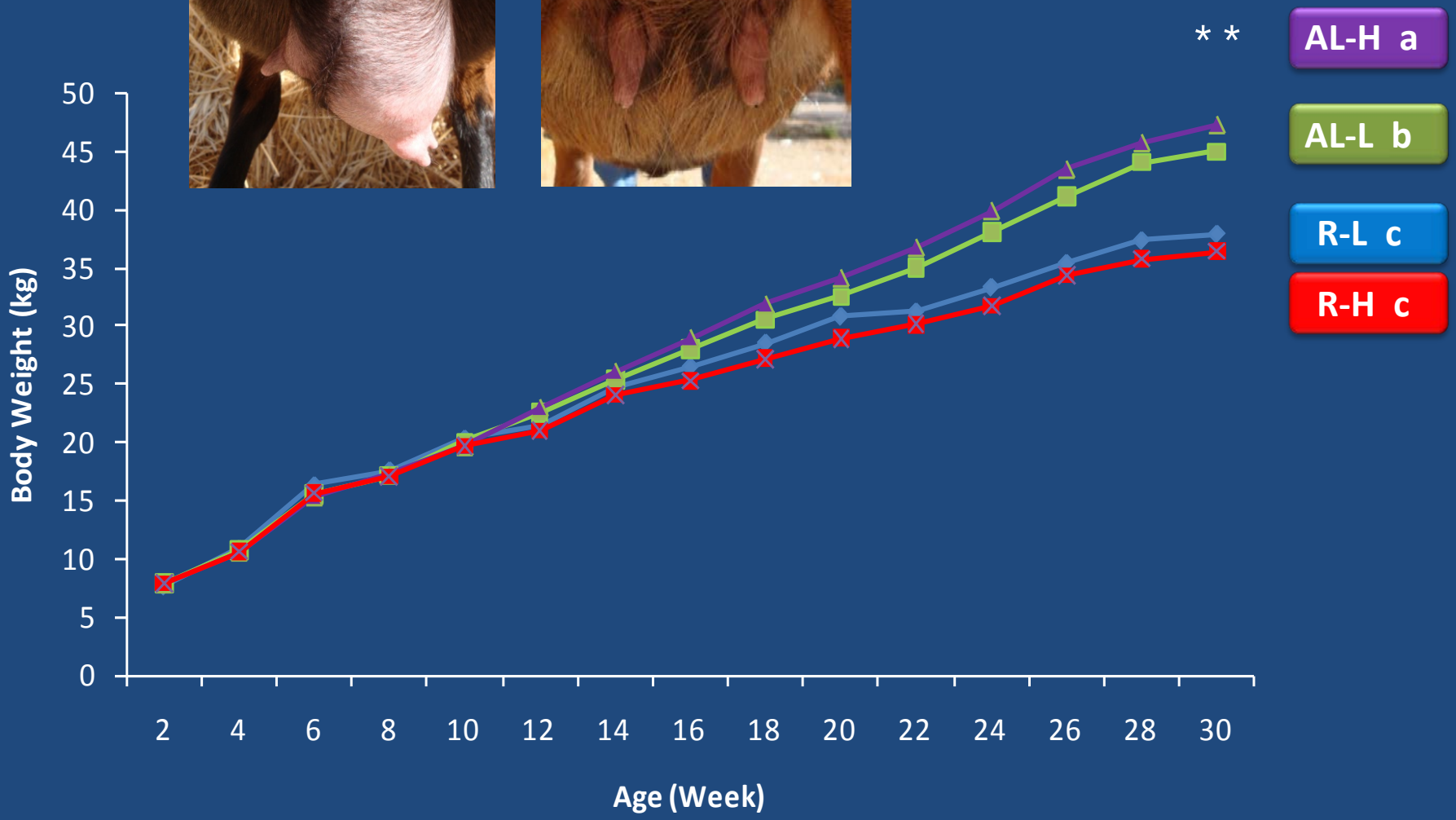
	NEL (Mcal)	%MAT	Distribution
AL-H	1.56	19	Ad libitum
AL-L	1.56	17	Ad libitum
R-H	1.44	17	Restricted
R-L	1.43	16	Restricted

Expected growth

Samples & assays

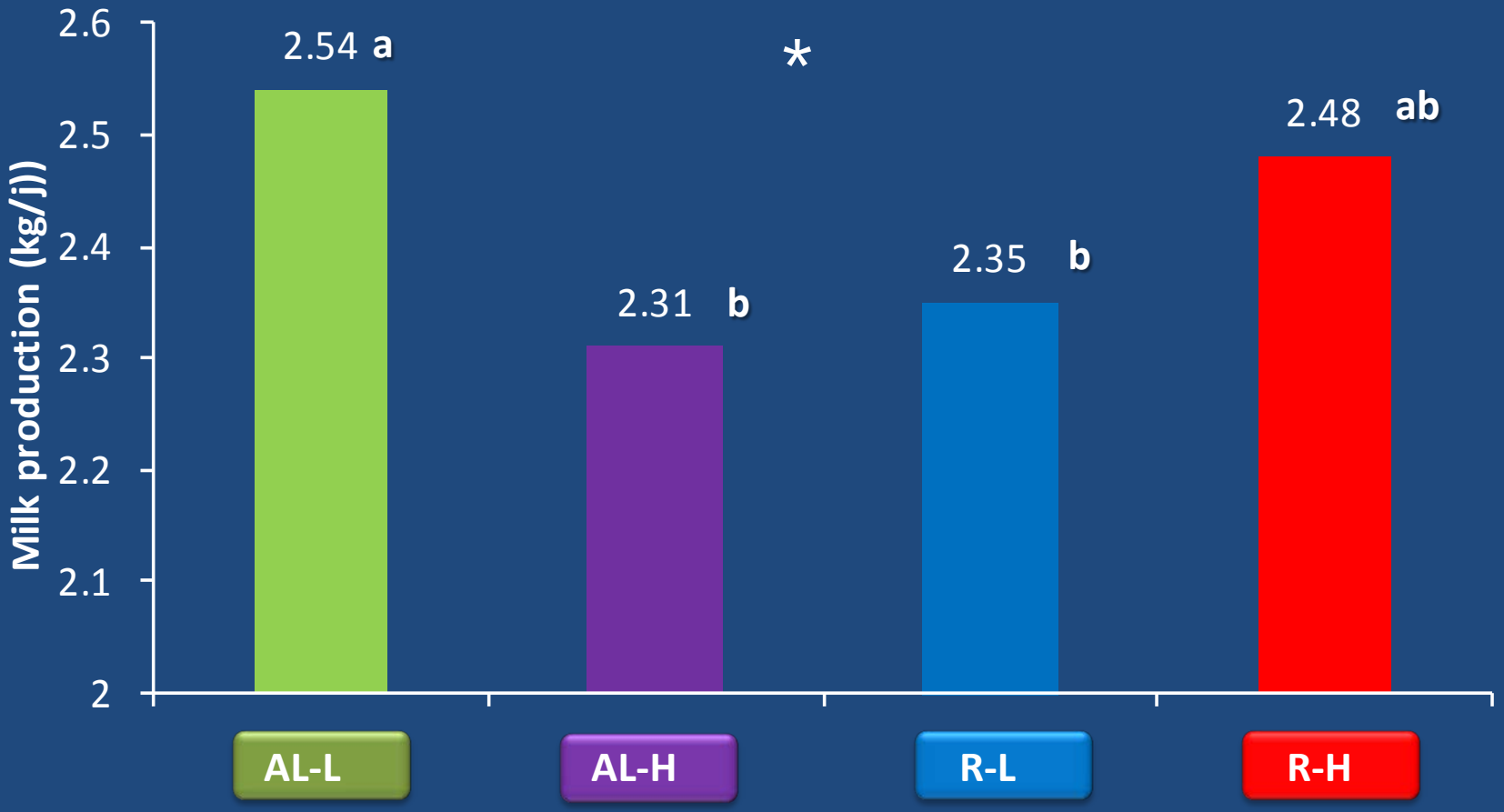
- Body weight
- Milk production

Effect of high feeding level on body weight



**, P < 0.001

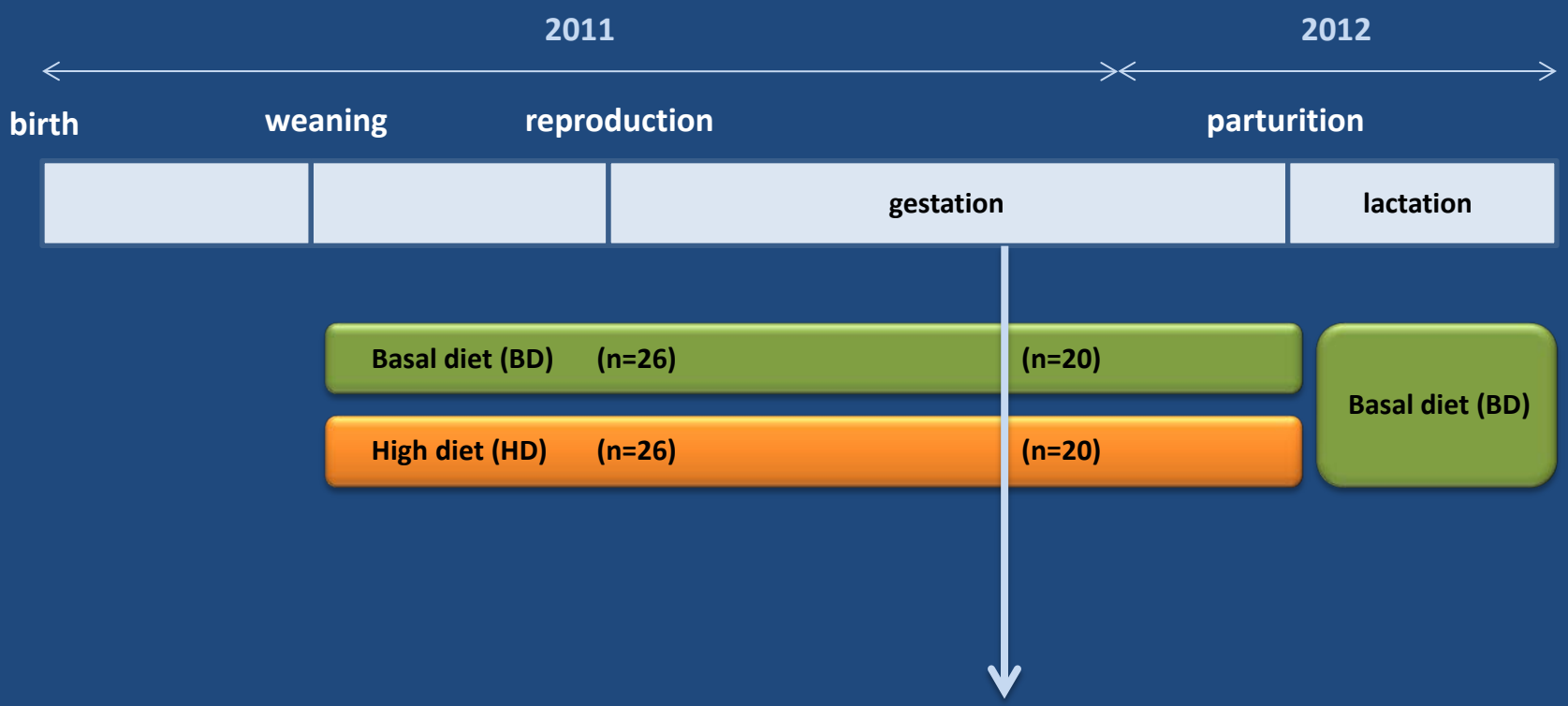
Effect of high feeding level on milk production



*, P < 0.05

During first lactation

Experimental design N°2



Diet :

- Concentrate (1.5 Mcal / 17 % crude protein)
  - Restricted (BD) / INRA recommandations
  - Ad libitum (HD)
- Hay
- Straw

Slaughter:

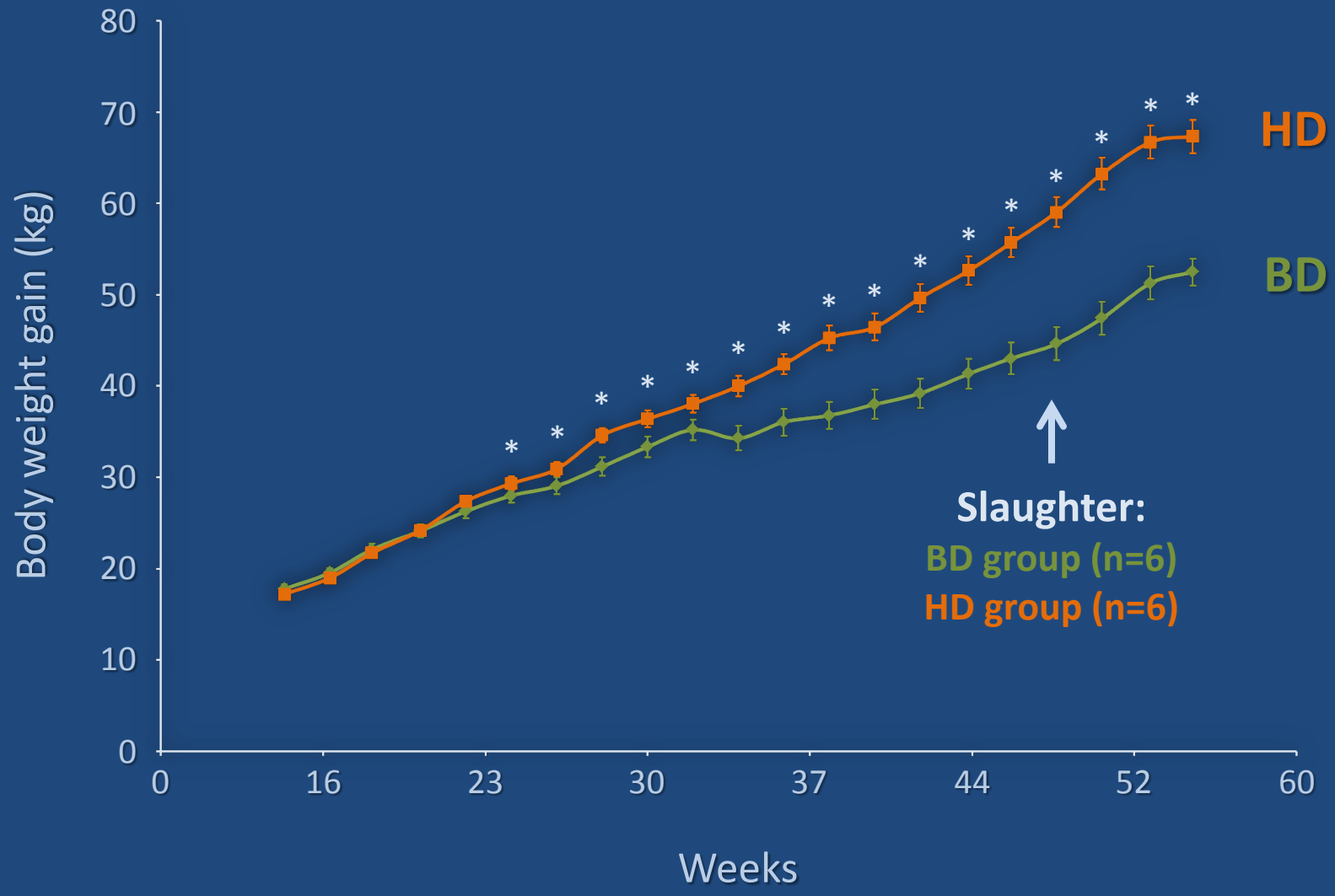
BD group (n=6)

HD group (n=6)

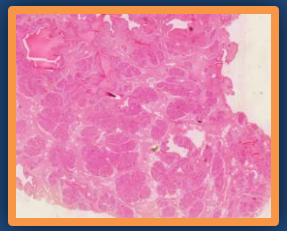
Samples & assays

- Blood
- Milk
- Mammary glands
- Body weight
- Milk production

Effect of high feeding level on body weight gain

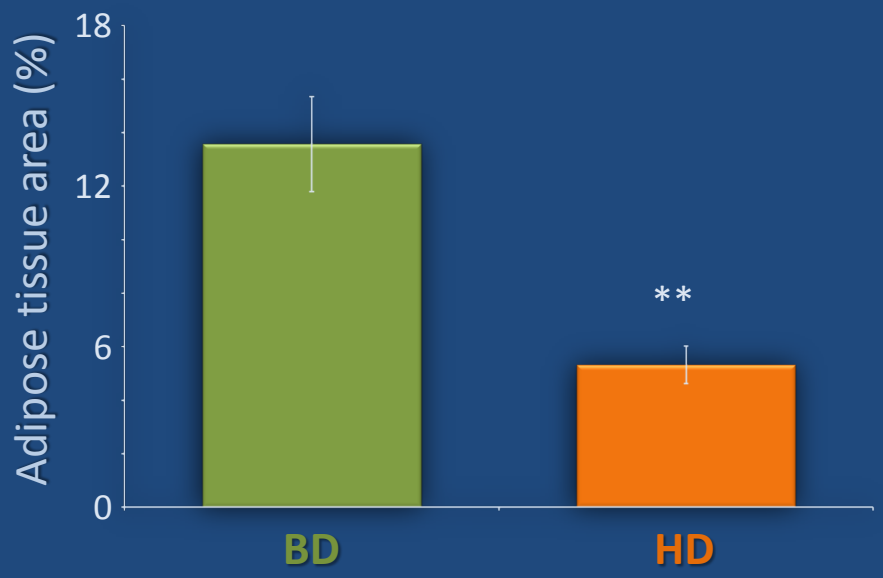


*, P < 0.01

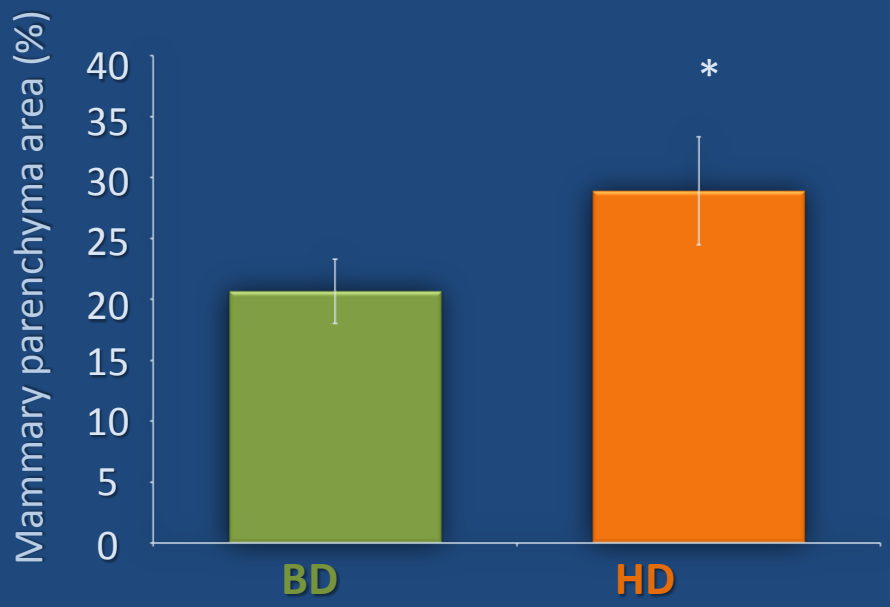


Effect of high feeding level on mammary gland structures

Adipose tissue



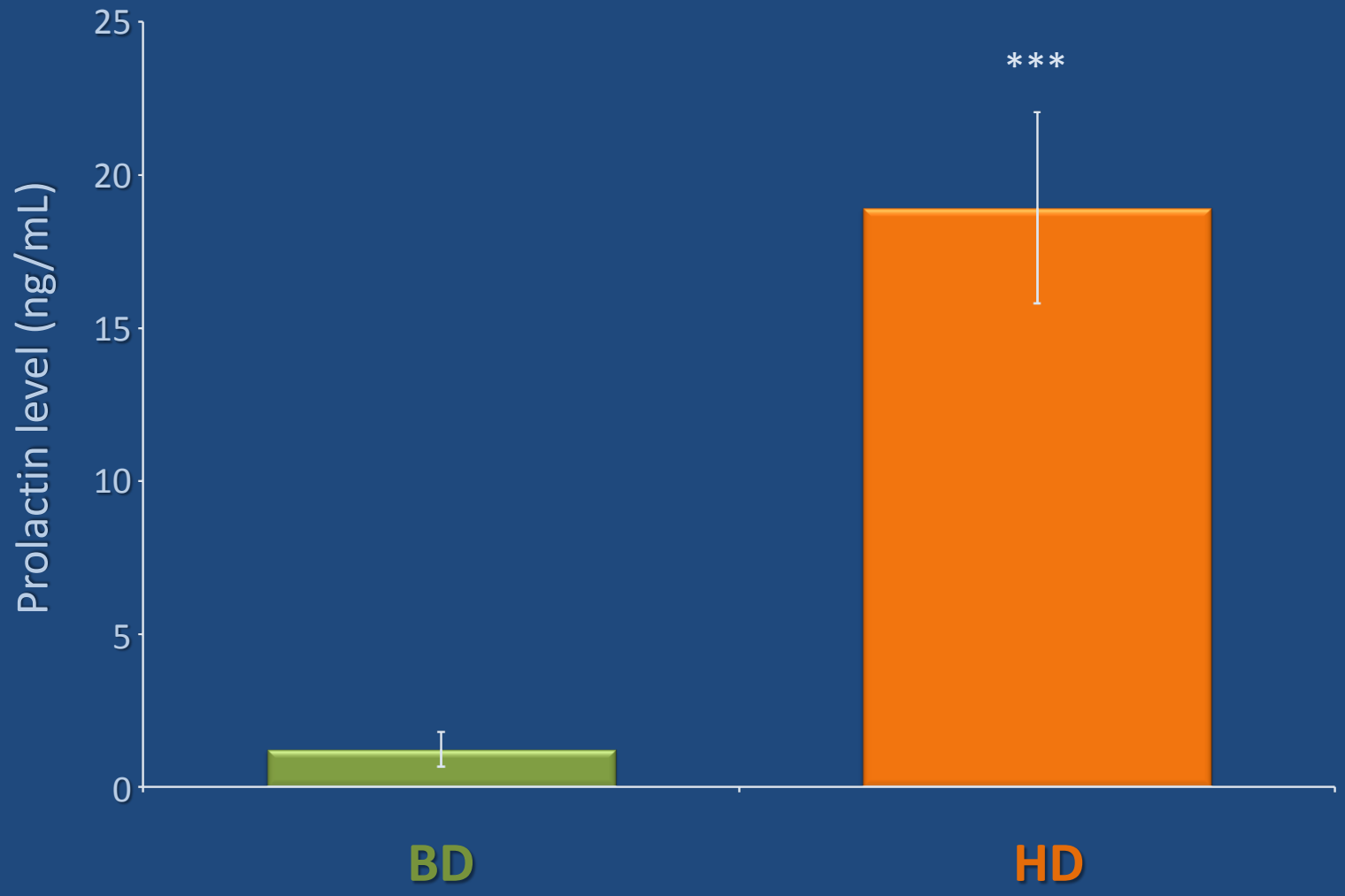
Parenchyma tissue



**, P < 0.01 ; *, P < 0.05

At mid-gestation

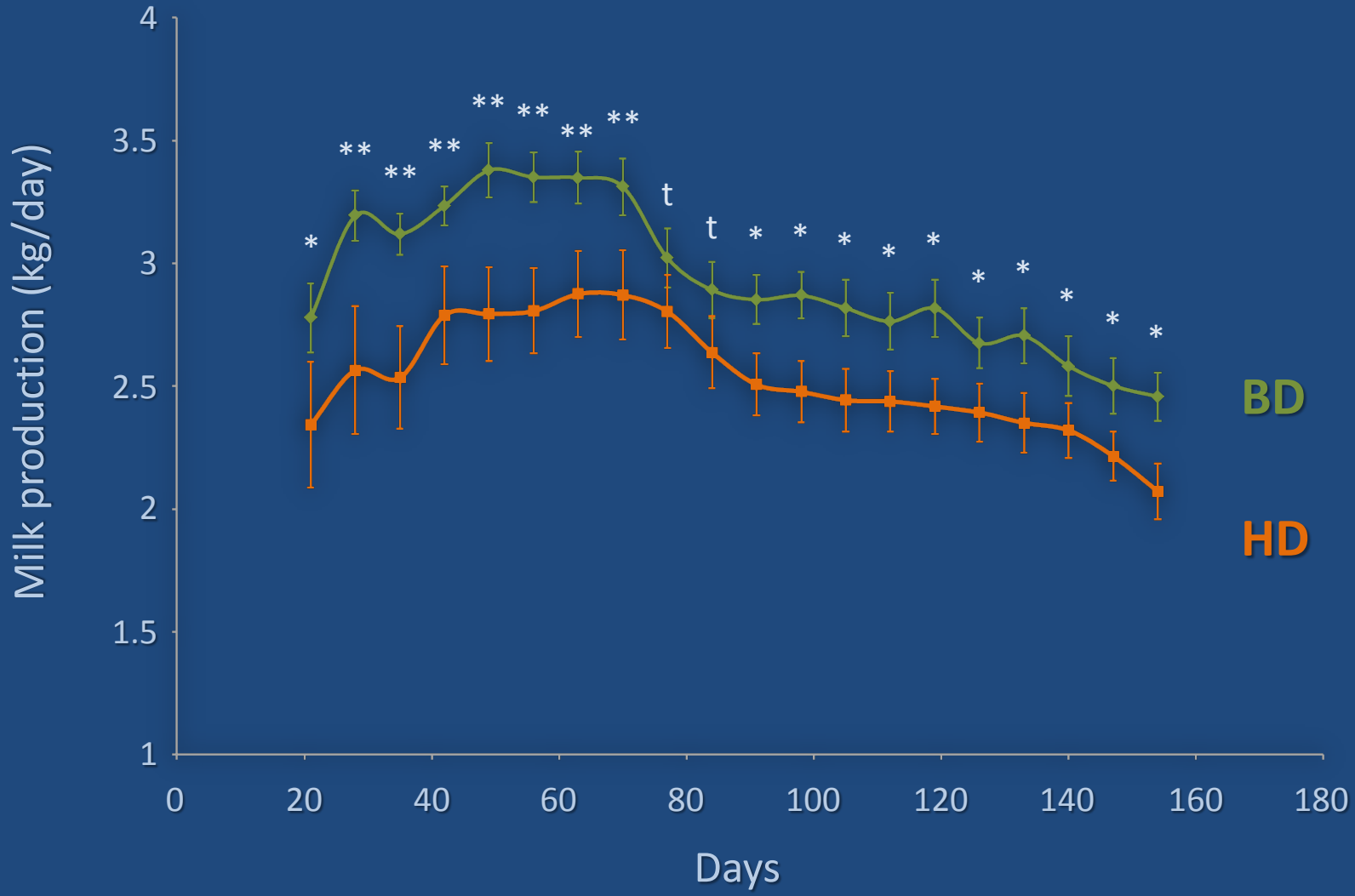
Effect of high feeding level on a major lactogenic hormone: Prolactin



***, P < 0.001

At mid-gestation

Effect of high feeding level on subsequent milk yield potential



t, P < 0.1; *, P < 0.05; **, P < 0.01

During first lactation

Conclusions – future directions

High feeding levels from weaning to parturition dramatically affected:

→ mammary gland development
→ mammary gland differentiation
→ milk yield potential

Manage feeding of young goats between weaning and parturition to increase mammary potential without affected mammary gland development.

Propose a feeding strategy to goat dairy farmers to manage goat kids.

Acknowledgements :

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Thank you for your attention !!

Questions ??