

# EVALUATION OF BODY MORPHOLOGY AND PRODUCTION TRAITS OF GOAT BREEDS IN HUNGARY



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European Regional Conference on Goats (ERCG)

International Goat Association (IGA)

Debrecen, 8-11 April, 2014

# INTRODUCTION

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## Motivation:

The majority of population were undefined, because of .....

- unknown coat colour and external characters
- lack of individual markings
- not registered production yield

*Limited scientific information on breeding and production of Hungarian goats.*

The last PhD dissertation on goat breeding:

**Bodó, Lajos (1959): Goat breeding in Hungary**  
(Magyarország kecsketenyésztése), Agricultural University,  
Gödöllő, Hungary (Agrártudományi Egyetem, Gödöllő)

# INTRODUCTION

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## **The Hungarian Goat Breeders' Association**

**Since 1998: differentiation of 3 breeds based on colour of hair:**

**Hungarian Milking White**

**Hungarian Milking Brown**

**Hungarian Milking Multicolour**

*accepted by the Hungarian authority*

# INTRODUCTION

## Hungarian Milking White



## Hungarian Milking Brown



## Hungarian Milking Multicolour



# INTRODUCTION

## Alpine



## Saanen



# OBJECTIVES

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- 1) What are the typical body measurements of the goat breeds kept in Hungary?
- 2) What are the average milk production traits of the Hungarian breeds (*daily milk yield, milking period, milk quantity, fat content, protein content, lactose content and somatic cell count*)?

# MATERIAL AND METHOD

Number of animals examined (n)	HMW	HMB	HMM	Alpine	Saanen
1) External characters	977	1244	1190		
2) Body measurements	198	182	202	146	216
3) Milk production	187	203	143		
4) Milk components	187	203	143		
5) External characters and milk production	121	162	145		
6) Body measurements and milk production, and efficiency	52	19	31	68	127

*HMW: Hungarian Milking White; HMB: Hungarian Milking Brown; HMM: Hungarian Milking Multicolour*

- 2) **Body measurements:** body weight, wither height, body length, thorax depth and width, pelvic width, hip width, head length, ear length and width and distance between eyes
- 3) **Milk production:** lactation length (day), lactation yield (litre), daily yield (litre); from monthly test milking
- 4) **Milk components:** individual milk samples from monthly test milkings, laboratory analysis for milk fat, protein, lactose content and somatic cell count

# MATERIAL AND METHOD

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## Statistical analysis

**Microsoft Access 2000; Microsoft Excel 2000 és 2007; SPSS 15.0 software**

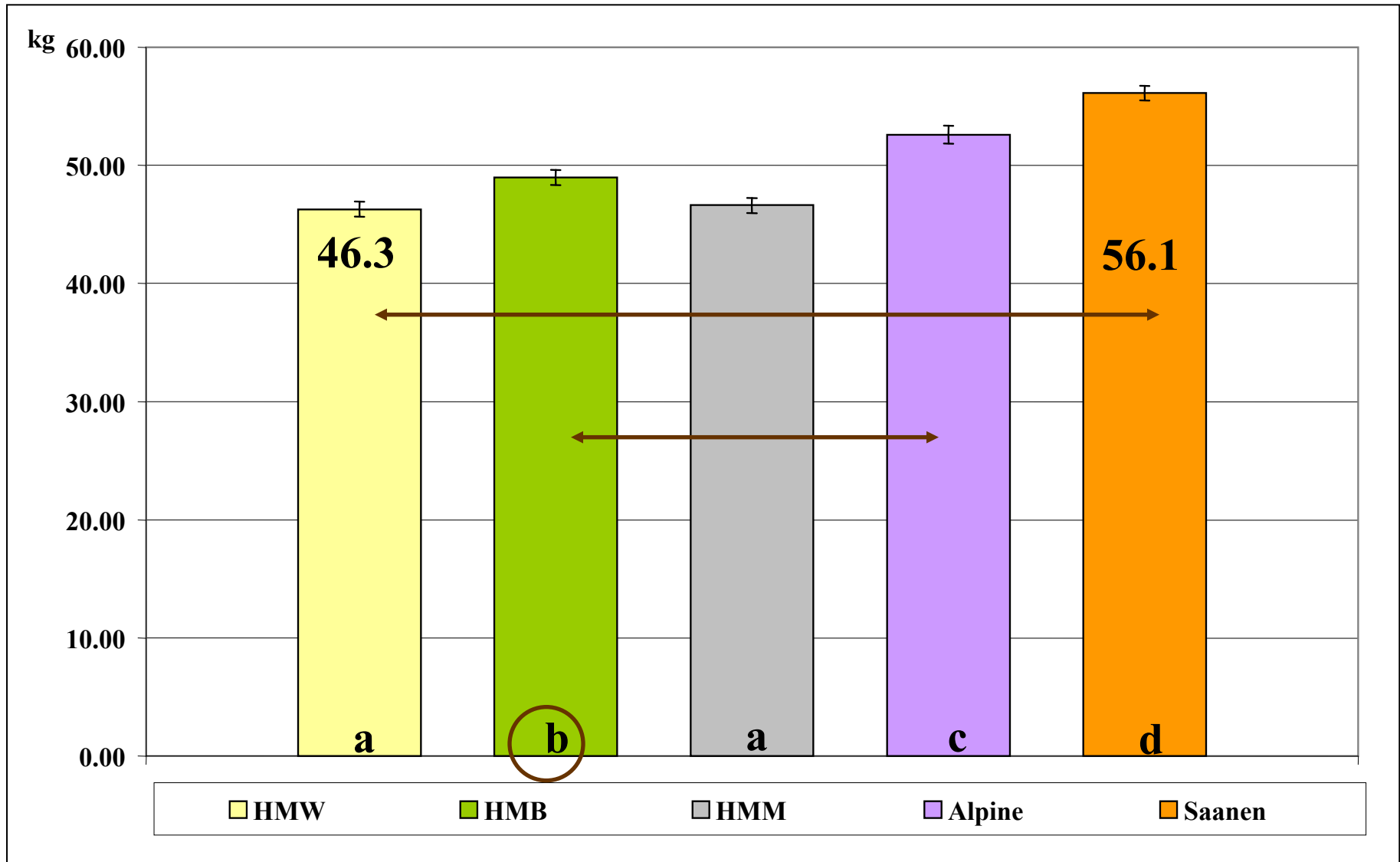


- **least squares means  $\pm$  standard error of mean (LSM  $\pm$  SEM)**
- **Pearson correlation**
- **Multivariate analysis of variance**



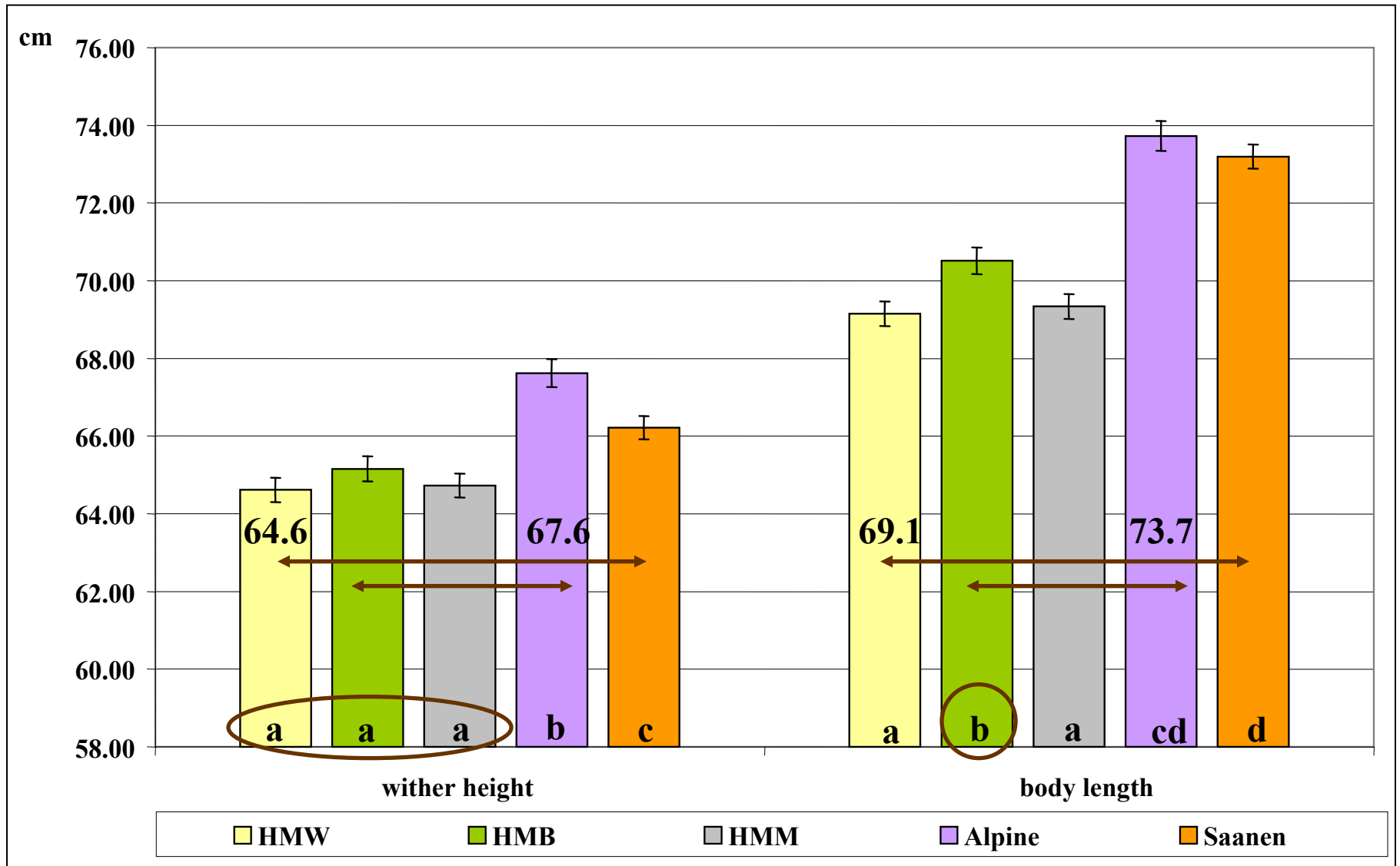
# RESULTS – *Body measurements*

## Average body weight of does (kg)



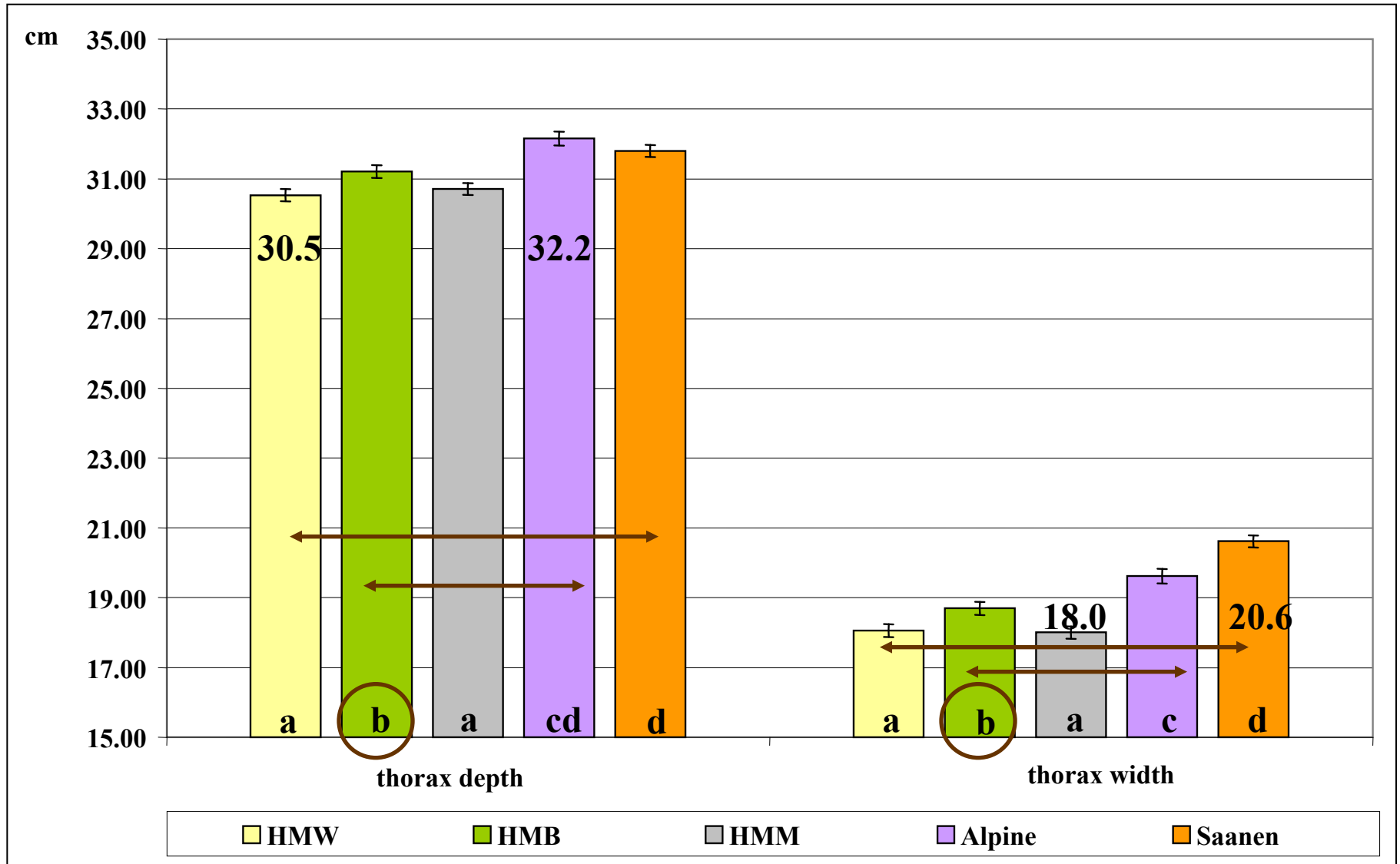
# RESULTS – *Body measurements*

## Average wither height and body length of does (cm)



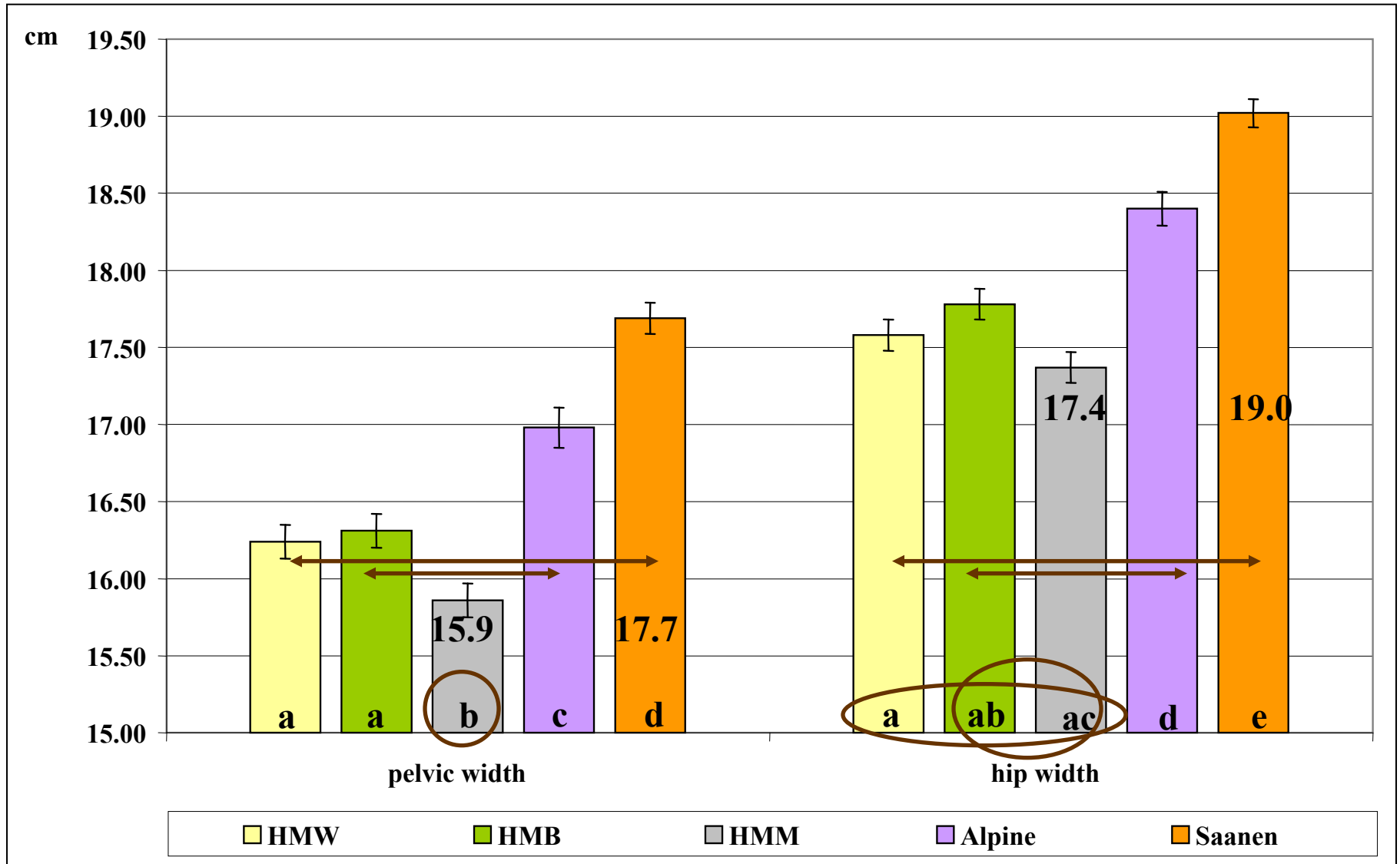
# RESULTS – *Body measurements*

## Average thorax depth and width of does (cm)



# RESULTS – *Body measurements*

## Average pelvic width and hip width of does (cm)



# RESULTS – *Body measurements*

## Effects on body measurements

	age	breed	farm	age*breed	age*farm	breed*farm
body weight	***	ns	***	*	***	ns
wither height	***	ns	***	ns	ns	ns
body length	***	ns	***	ns	ns	ns
thorax depth	***	*	***	ns	**	ns
thorax width	***	ns	***	ns	***	ns
pelvic width	***	ns	***	*	**	ns
hip width	***	*	***	ns	**	ns
head length	***	*	***	ns	*	*
ear length	ns	***	ns	ns	ns	ns
ear width	ns	*	ns	ns	ns	ns
dist. between eyes	***	*	***	ns	ns	ns

\* $P \leq 0.05$ ; \*\* $P \leq 0.01$ ; \*\*\* $P \leq 0.001$ ; ns=non significant

# RESULTS – *Body measurements*

## Correlation between body measurements

203 pairs of features: significant ( $P \leq 0.05$ ;  $P \leq 0.01$ ;  $P \leq 0.001$ )

Significant in all 5 breeds:

	<b>wither height</b>	<b>body length</b>	<b>thorax depth</b>	<b>thorax width</b>	<b>pelvic width</b>	<b>hip width</b>
<b>body weight</b>	0.34-0,51	0.55-0.72	0.49-0.67	0.42-0.78	0.48-0.78	0.42-0.75
<b>wither height</b>		0.35-0.56			0.26-0.47	0.22-0.43
<b>body length</b>			0.40-0.51	0.21-0.55	0.30-0.66	0.36-0.60
<b>thorax depth</b>				0.38-0.54	0.30-0.58	0.35-0.60
<b>thorax width</b>					0.20-0.71	0.19-0.69
<b>pelvic width</b>						0.48-0.79

The strongest correlation:

Alpine: body weight — thorax depth ( $r=0.66$ )

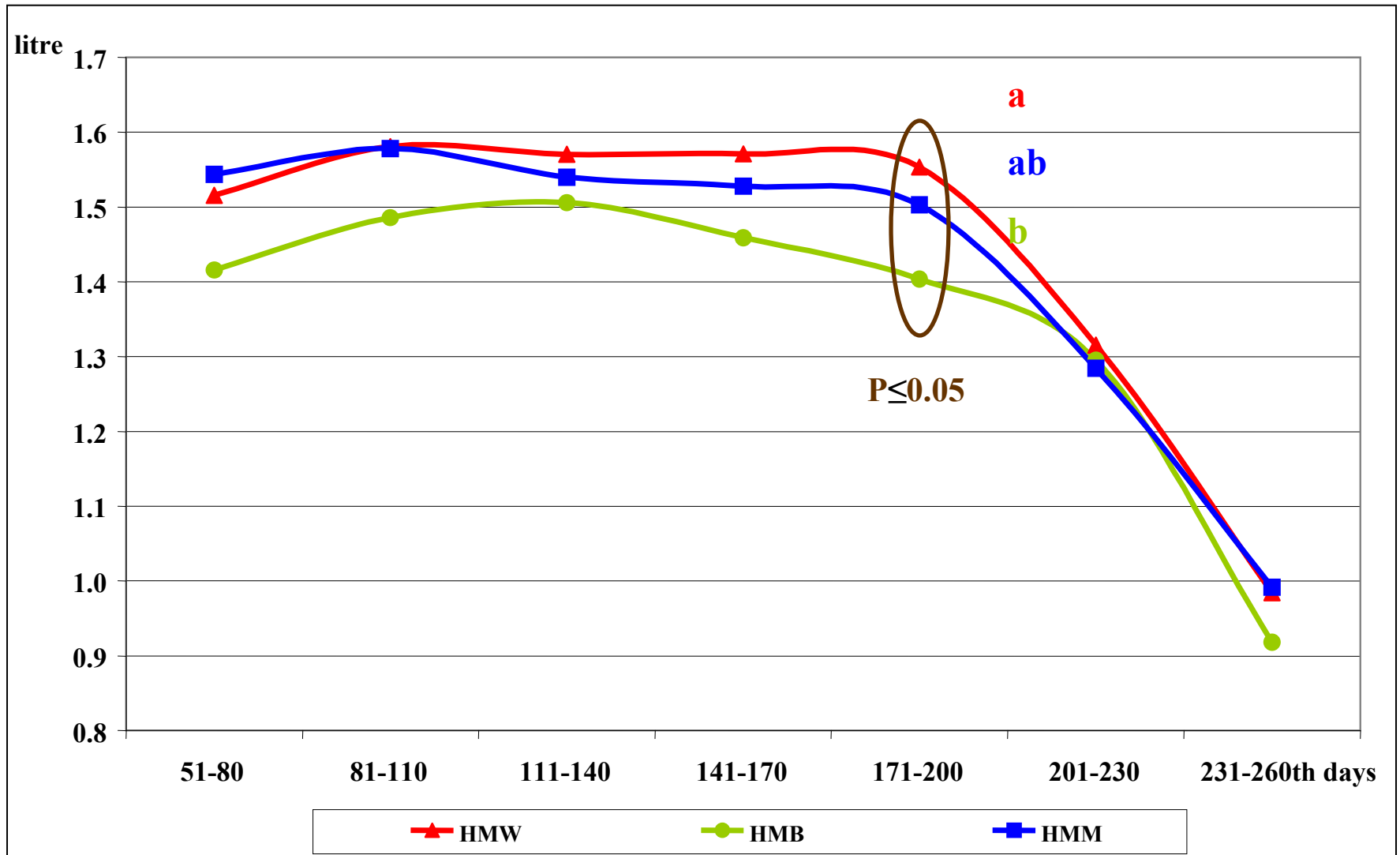
Saanen: pelvic width — hip width ( $r=0.79$ )

3 Hungarian breeds: significant low or medium correlation

Negative correlation: Alpine: wither height — thorax width ( $r=-0.17$ )

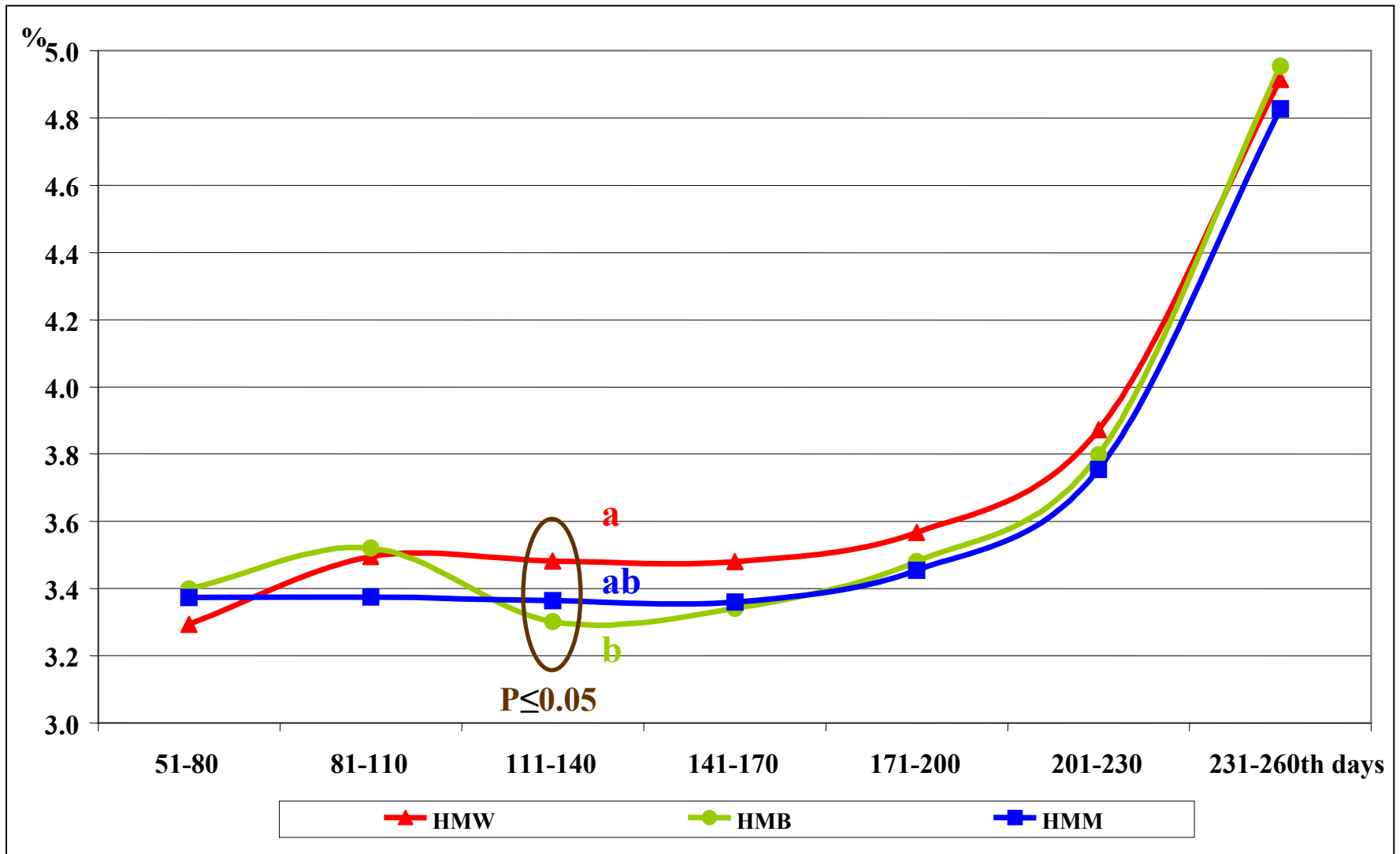
# RESULTS – *Milk production*

## The daily milk yield during lactation by breed



# RESULTS – *Milk components*

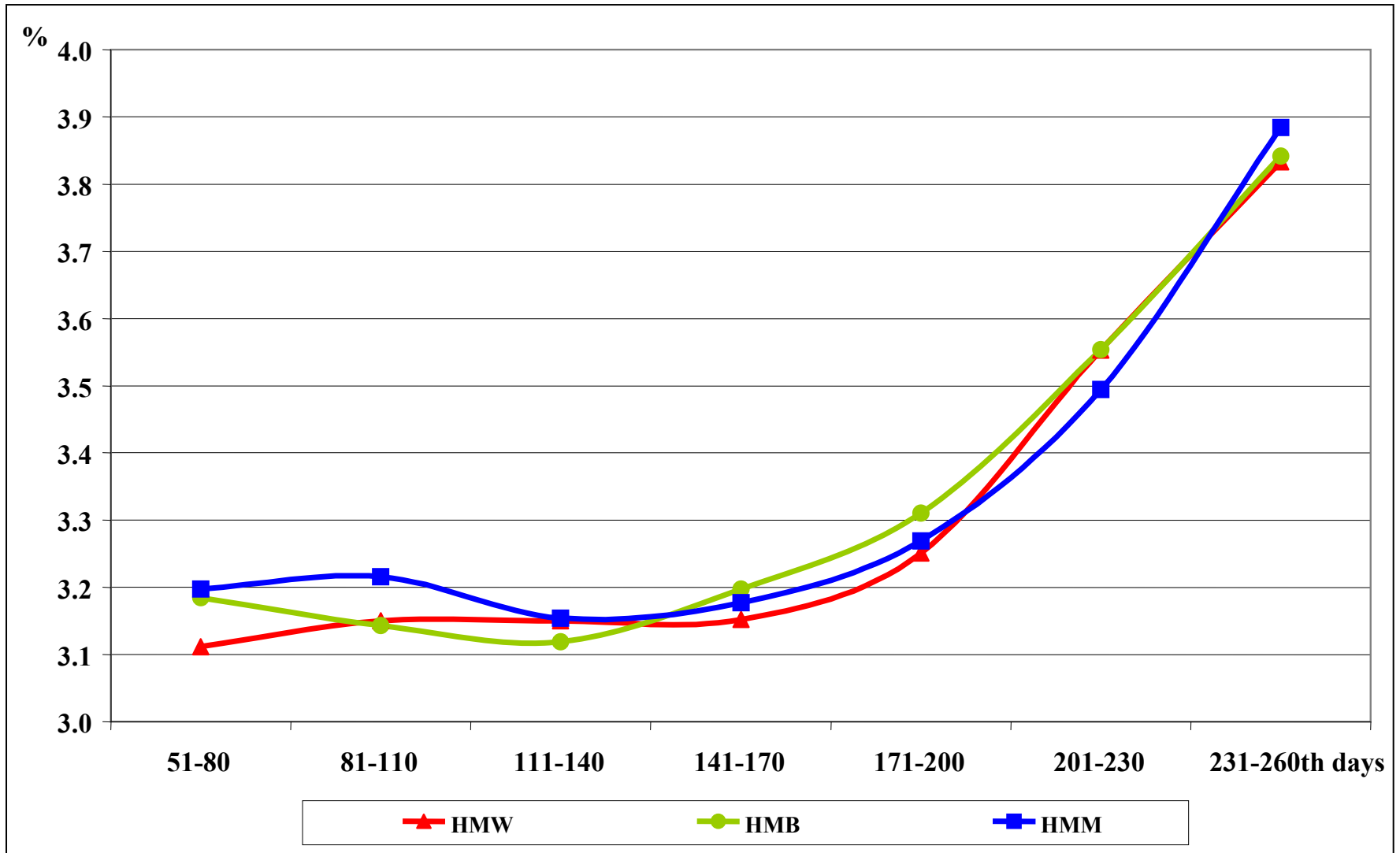
## The fat content during lactation by breed





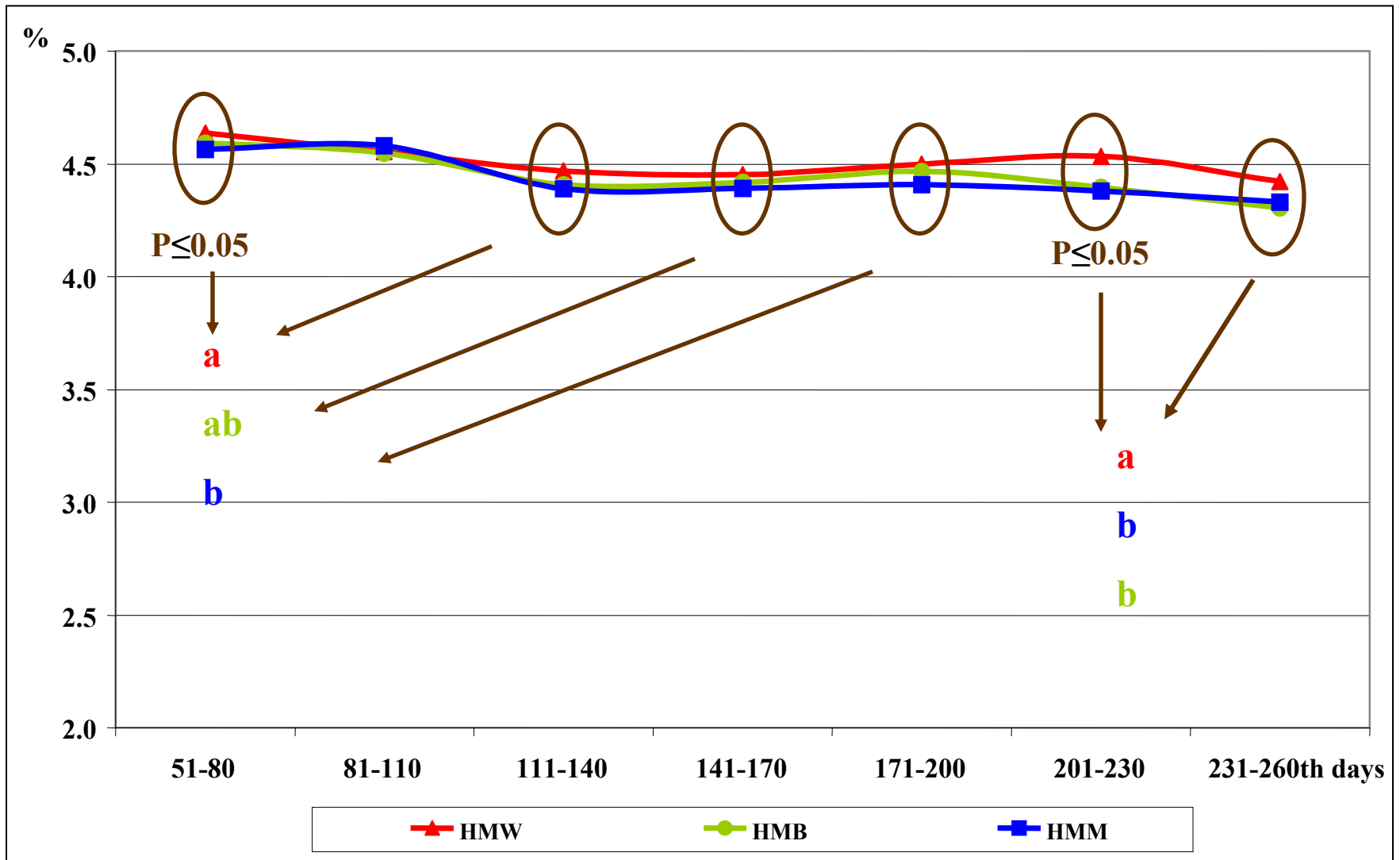
# RESULTS – *Milk components*

## The protein content during lactation by breed



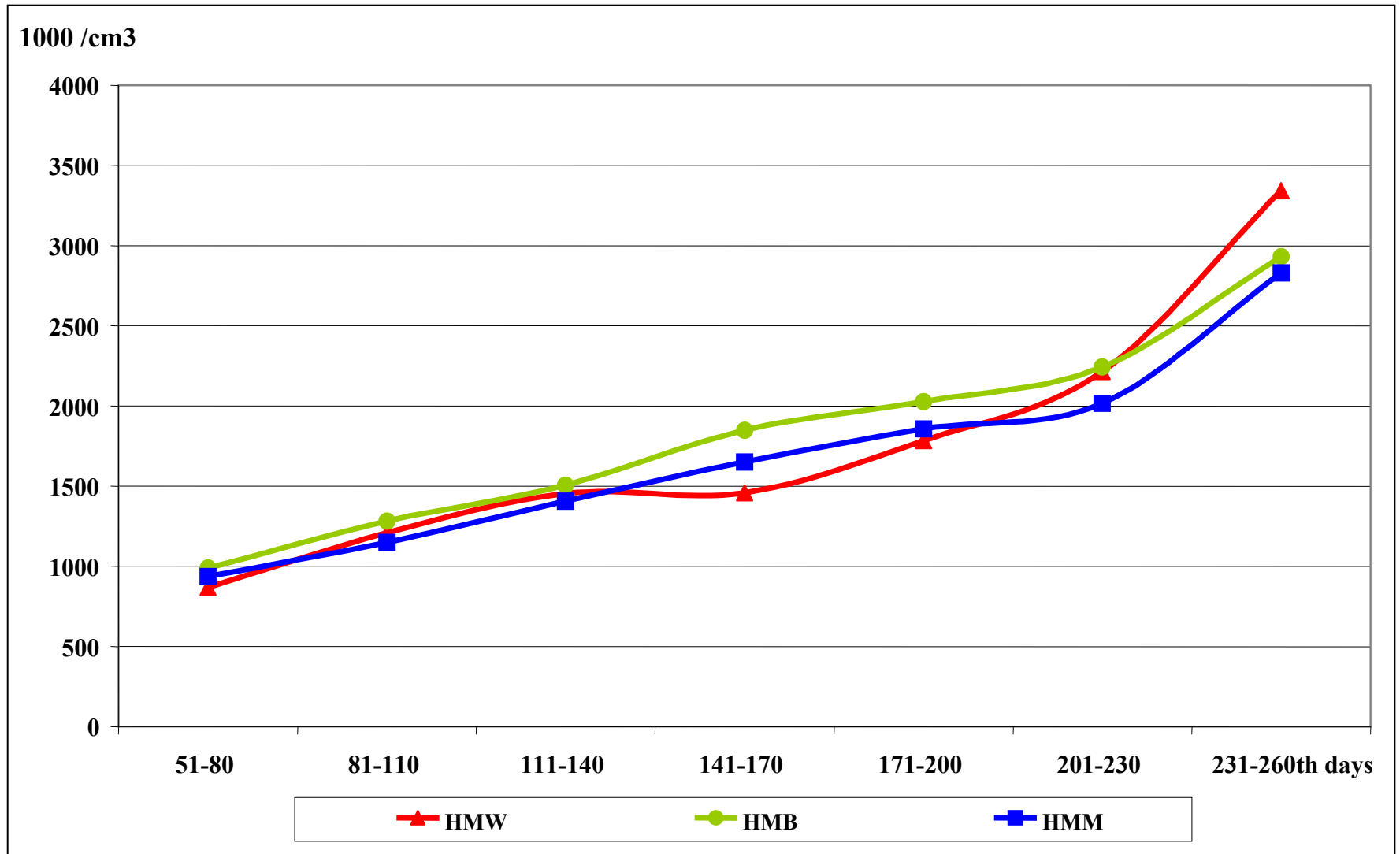
# RESULTS – *Milk components*

## The lactose content during lactation by breed



# RESULTS – *Milk quality*

## The somatic cell count during lactation by breed



# CONCLUSIONS

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Significantly different in every examined **body measurements**:

Hungarian Milking White — Saanen

Hungarian Milking Brown — Alpine

similar measures in Hungarian breeds, but HMB is the smallest

Hungarian does mated too early, without attention to full growth, therefore remained smaller and produced less milk

Proposal: starting the milking period as soon as possible after the kidding, and starting the dry season after 200 days

Daily **milk yield**: similar previous results

significant differences in the last third of lactation (171-200th days)

**The three Hungarian breeds could be the base of a genetic experiment to find the genetic background of the differences and/or similarities among the three breeds**

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Thank you for your kind  
attention!

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