

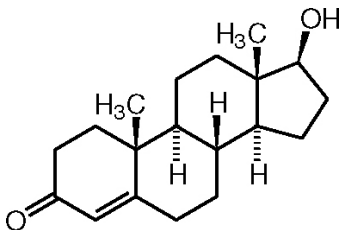
# RELATION BETWEEN ORIENTATION REACTION AND SALIVA TESTOSTERONE LEVELS IN PIGS

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# Introduction

Testosterone – male steroid hormone (10x higher level in blood than in women, but women are more sensitive)



– secreted by testicles, ovaries and adrenal glands

– important role in ontogeny (pre & post-natal)

– sex and brain masculinization

– behavior (orientation, aggression, depression, spatial ability)

– body development (2D:4D, fat, bones, muscles)

– mobilization of energy under load

– precursor of estradiol and dihydrotestosterone

Gray, L.,A. et al. 1969, Celec, P. et al. 2002, Coluccia, E. et al. 2004, Anders, S., M. et al. 2005, Falter, C.M. Et al. 2006, Talarovicova et al. 2009, Sachser, N. et al. 2010, Hodossy, J. et al. 2010,

# Introduction

## Testosterone & animal production

- boar taint and pork quality
- sexual maturity and reproduction
- stress response

Moya, S., L. 2008, Sachser, N. et al. 2010, Kumaresan, A. et al. 2011, Albrecht A., K. et al. 2012,

# Aim

compare behavior in pigs with different testosterone levels (TSL) placed to unknown room.

H: animals with better orientation in unknown space spend more time near door.



# Materials and Methods

Improved White breed – n = 29, weight from 18.5 kg to 27.5 kg, 14 females, 15 males, castrated in 2<sup>nd</sup> week

20 minutes test

CCTV system

Noldus Observer XT 11.5

Saliva samples – before and after test

TSL - ELISA method, kit Testosterone saliva DiaMetra

Microplate Reader Model DV 990BV4, UniEquip Deutschland



# Materials and Methods

Recording

Standing

Door

Moving

Room

Lying

Evaluation

Total duration

Mean per minute

Analysis

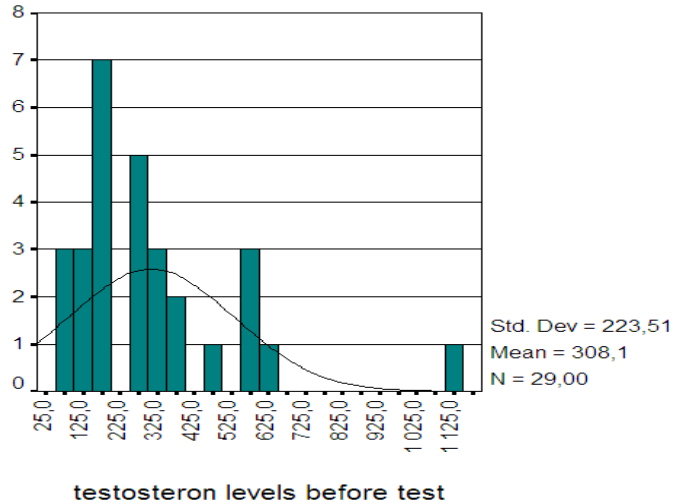
Correlation TSL x behavior traits

Comparison of behavior among quartiles by TSL

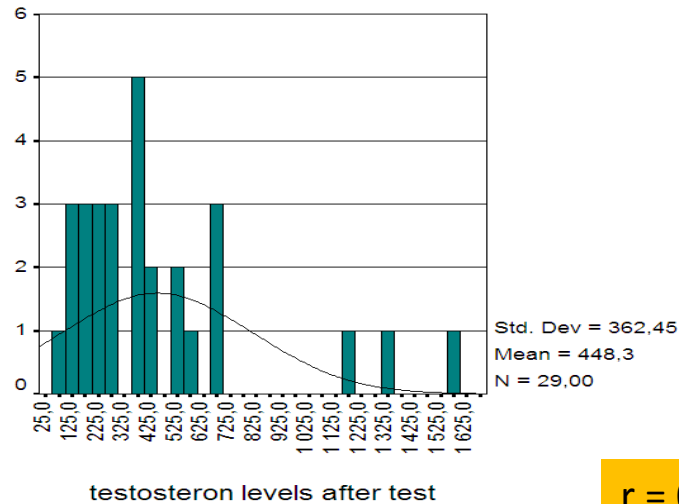
SPSS 11.0



# Results and discussion



Min = 78.91 pg/ml  
Max = 1131.06 pg/ml  
Range = 1052.15 pg/ml



Min = 93.12 pg/ml  
Max = 1589.36 pg/ml  
Range = 1496.24 pg/m

$r = 0.85, P = 0.66$   
 $t = -1.844, P = 0.076$

Colenbrander et al., 1978:  $0.47 \pm 0.4$  ng/ml, Albrecht et al., 2012:  $\sim 1$  ng/ml

# Results and discussion

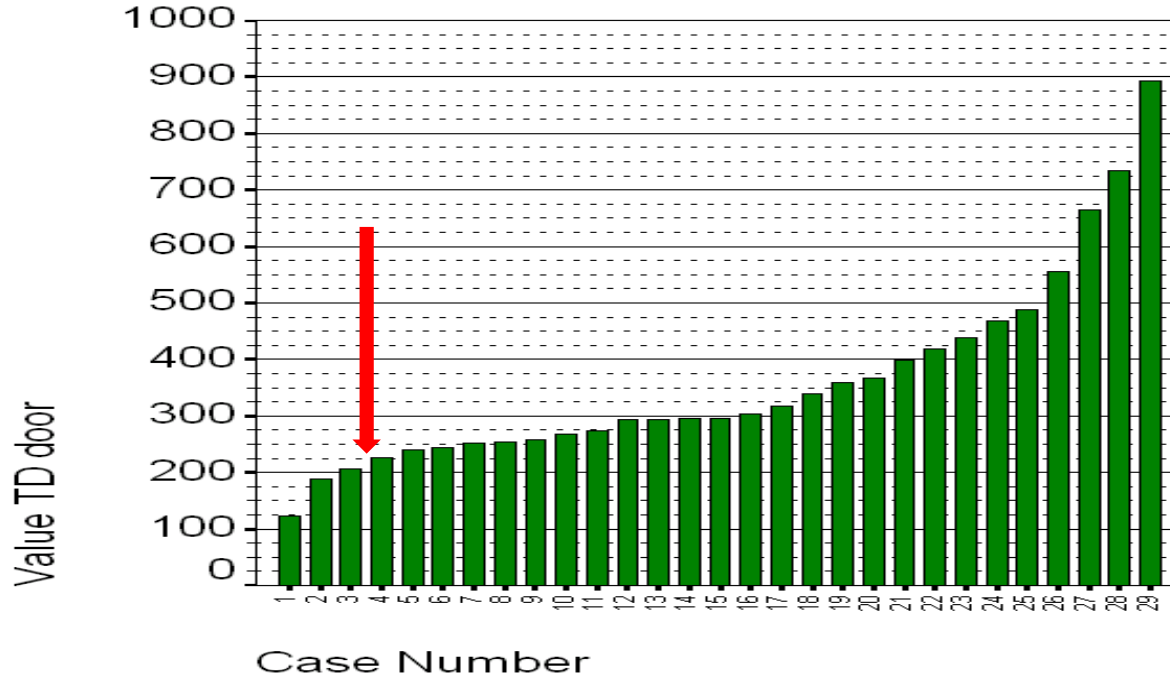
	TD moving	TD standing	TD lying	TD door	TD room
N	29	29	29	29	29
Mean	452,75	606,30	140,95	360,66	839,34
S. D.	101,88	152,45	201,83	171,36	171,36
Median	479,57	649,12	2,35	295,97	904,03
Minimum	185,76	287,36	0,00	123,11	307,36
Maximum	629,03	858,17	726,88	892,64	1076,89
Range	443,27	570,81	726,88	769,53	769,53

Random movement  225 sec per squares near doors





# Results and discussion



TD lying x TSL  
 $r = 0.41$ ,  $P = 0.03$

TD lying doors x TSL  
 $r = 0.4$ ,  $P = 0.03$

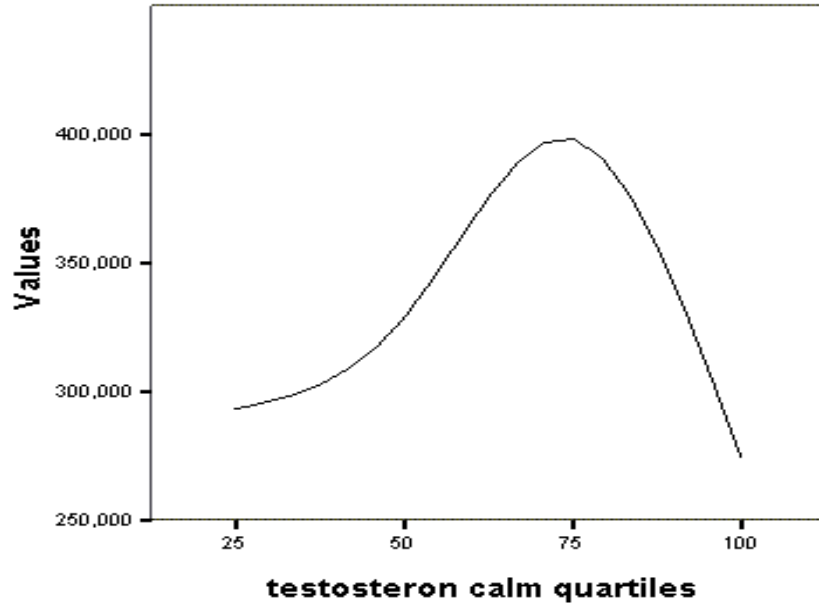


# Results and discussion

## Case Summaries

Variables : TD door

Statistics : Median



## Case Summaries

TD door

testosteron	N	Median
25	7	293,090
50	8	328,565
75	7	398,050
100	7	273,680
Total	29	295,970

\*

\*

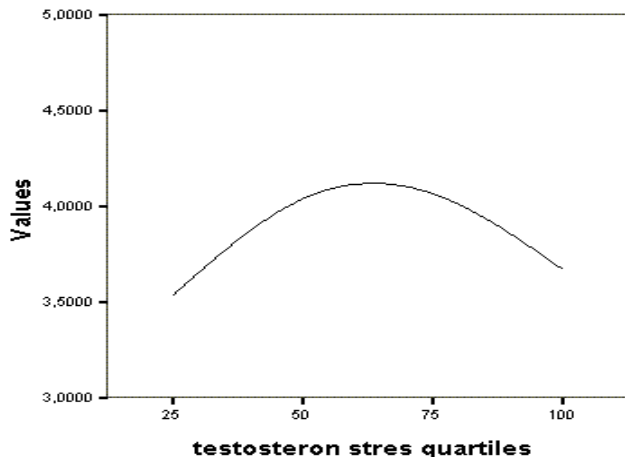
P = 0.025



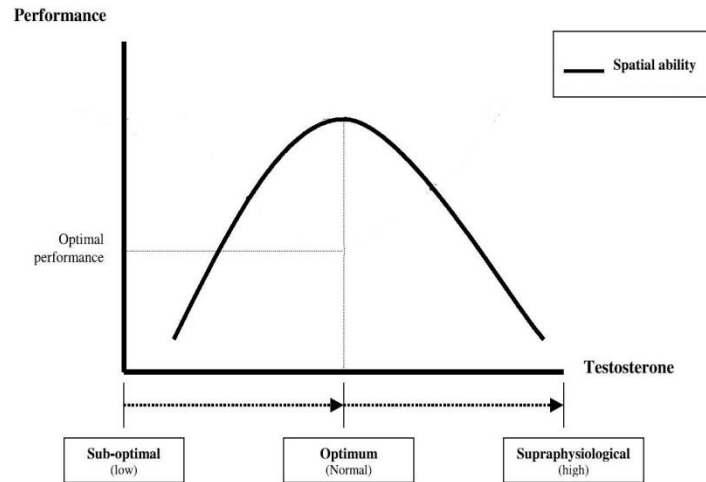
# Results and discussion

## Case Summaries

Variables : Mean door  
Statistics : Median



	Mean door [s]
N	29
Mean	5,14
Std. Deviation	3,80
Median	3,80
Minimum	2,67
Maximum	19,84
Range	17,17



O'Connor, D., B. et al., 2001

## Case Summaries

Mean door		
testosteron	N	Median
25	7	3,5325
50	8	4,0372
75	7	4,0648
100	7	3,6688
Total	29	3,8004

# Conclusion

- Difference in natural levels of saliva testosterone in calm state and after stress
- Difference in behaviour in animals with different TSL
- Animals with higher TSL tend to spent more time near door to room, but not extreme TSL.





Spectrophotometer CM-2600d



Thermo Nicolet 6700 FT-IR Spectrometer



Microplate Reader Model DV 990BV4



Electrophoresis

# Consequences to

- Carcass
  - pork colour
  - aminoacids
  - fatty acids
- Growth and body development – digit bones ratio
- Stress response – neuroreflective types & stress hormones



# Thank you!

