

Review

Determining insulin sensitivity from glucose tolerance tests in Iberian and Landrace pigs

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Dear authors,

Thanks a lot for submitting your text to PCI Animal Science.
Please find below my comments about your text.

General comments:

This text present the results on the difference in insulin sensitivity of two breeds of pigs, the Iberian pig (native breed of the Mediterranean basin) and the Landrace pig (conventional breed).

The low number of pigs in this study aiming to study the breeding effect is a question. Please justify - and assume - the low (and non-balanced) number of pigs, and the potential consequences on the statistical analyses and results (statistical power of the analysis for example).

Then, it seems there is small incoherence between the text and the figures.

Please check carefully the graphs, and correct if necessary. If there is no mistake on the graphs, please consider the comments and explain the inconsistency.

Details:

Abstract

L.19 : Please use the same definition for IAGTT between the abstract and the text. You use intra-arterial glucose challenge in the abstract and intra-arterial glucose tolerance test in the text. Prefer "tolerance test" which is more precise.

In order to increase understanding, please use the same words all over the text.

L. 31 : Please define QUICKI and HOMA-%B.

In general, do not use abbreviation at the beginning of a sentence.

Implications L. 51 : Could you please precise exactly what are the implications for the breeds (and the breeders).

Introduction

L. 66 : could you please precise the two levels of CP.

Materials and methods

L. 80 : I guess it was originally planned to use the same number of animals of each breed ? If yes, could you please indicate it and precise that results were available for only 9 animals. If not, could you discuss the unbalanced design ?

L. 92 : sterile saline : add solution ?

L. 101 : delete RIA (only use one time)

L. 112-113 : You used trapezoidal geometry in order to calculate AUC. Could you please give more details concerning this method. How did you process, with R, with Excel ?

L. 115 : specify the last AUC. AUC180 ?

L. 117 - 118 : Please precise IAGTT before "challenge".

Could you explain why you decided to limit the analysis from 0 to 30 min. If we consider the Figure 1, the insulin level is not returned to its basal level at t=30 min, especially for the Landrace breed.

L. 116-119 : Could you please cut this sentence in two sentences.

L. 127 : used instead of utilized ?

L. 146 : I am bored because there are more sampling by pigs than animals ...

I suppose you used the autoregressive option in order to consider the pig effect has no interest, and to define a model in repeated measures by assuming that the residuals of the measurements of the same pig are correlated? Could you please precise?

Moreover, I think it is very ambitious (on a statistical point of view) to test a breeding effect on 4 vs. 5 animals. Could you please justify more the low number of animals used?

L. 149 : Did the pig consider as the random effect ? Could you precise.

L. 152 : ad a space between the point and “Homogeneity”, and correct “Homogeneity” in Homogeneity.

L. 156 : Did the pig consider as fixed effect ? Could you explain why you used a GLM model in this case, and a MIXED model in the other case?

Results

L. 163 : use L instead of l for liter abbreviation

L. 171 : please avoid abbreviation at the beginning of the sentence

L. 177 : Only tendency for time 90 if we consider Figure 1.

L. 178 : Only significant (tendency) at time 25 if we consider Figure 1.

General comments about the insulin results on Figure 1: I wonder about the increase in plasma insulin between -10 and 0 min. Could you please explain what's happen? The increase in plasma insulin is greater than those which occurs after IAGTT. Is there a mistake in the Figure 1?

I suppose this is due to the fact that your first sample is not exactly at the same time than the glucose infusion. Can you estimate the exact delay and indicate it in the Figure ?

L. 187 : Indicate the peak values of glucose for each breed. If we consider a basal glucose level at 4.68 and 5.85 mM, respectively for Iberian and landrace, and an average increase of 288%, we obtain a glucose level equal to 18.2 and 22.7 mM respectively for the two breeds. It seems inconsistent with the Figure 2, especially for the Iberian pigs which appear greater. Could you check and give the respective increase for both breeds.

L. 189 : Check it is well 25 min for the Landrace pigs. It is not the case on the Figure 2.

L. 190 : give the value for each breed and precise the time the nadir occurred for each breed. I think it would be interesting to define nadir.

General comments about the glucose results on Figure 2: It seems there is an inconsistency between the Figure and the text. In fact, you write glucose peaked immediately after glucose infusion. It is not the case in the figure, which an increase occur from time -10 min to 0. I guess there is the same explanation than for the Figure 1. If there is no problem on the Figure, please explain this increase during fasting, and adjust the text.

L. 195 : not exactly for the Landrace pigs, in which an increase occurred from time -10 (in Figure 3).

L. 201 : and 0-10

Discussion

L. 208 : I am surprised by the term “obese”. In the introduction, you did not define them as well.

L. 221-222 : “The limited growth and development of slow growing pigs could result at least partly from lower concentrations of plasma insulin” : This seems not consistent with your results showing greater fasting (and after the IAGTT after 90 min) plasma concentration in Iberian pigs. Please discuss or precise

L. 228 : infusion instead of “ingestion” ?

L. 233 : not 20 min for the Landrace ?

L. 235 : replace “challenge” by “tolerance test” or by IAGTT

L. 239 : please ad a reference

L. 244-245 : I don't understand well the interpretation between the greater gastrointestinal tract and the decreased AUC of glucose.

L. 260 : ad “here” or “in the present work” after “we report”.
L. 268 : close the parenthesis
L. 285-289 : precise the references
L. 307 : indicate the QUICKI index (0.5 vs 0.6) directly after “QUICKI index”
L. 310-316 : please replace your results in this paragraph
L. 327-328 : this sentence is not really consistent with the abstract.
Abstract : “may indicate an early stage of insulin resistance”
Discussion : “insulin resistance has not yet been fully established”

General comments on discussion : it is sometimes difficult to understand if you write about your results or from the bibliography. Could you please precise in each case. If I understand well you make the hypothesis that unexpected results concerning “no insulin resistance evidence in Iberian pigs” is partly due the age of the animals ? Could you precise.

Could you please take a more assumed position on your results and their discussion.

References :

Check the notation of the pages. There is sometimes space, sometimes no.

L. 357 : Homogenize the citation of Animal between this citation and this in L. 373 (Gonzales-Valero et al., 2014)

L. 360 to 365 : references are not in the alphabetical order

L. 366 to 371 : references are not in the alphabetical order

L. 377 : Is this a book ? Indicate the chapter, the pages and the editor(s)

L. 381 : replace & by and ?

L. 399 : indicate the chapter and pages used

L. 417 : there is no indication of pages, editors. Is there a book ?

L. 422 : there is no page

Table 1 :

Please change in accordance with the text “challenge” by “tolerance test”

IAGTT is not necessary because not used after

ns : indicate the p value instead of not significant

Homogenize the notation between mmol/L and mM in accordance with the text

Replace l by L for liter

Table 2 :

Replace “challenge” by “tolerance test”

Indicate the amount of infused glucose

ns : indicate the p value instead of not significant

Figure 1 :

Replace “challenge” by “tolerance test”

Modify the indication : “comparisons versus basal or control treatment”. You compared the breeds and not a control to a treatment. And I wonder if it would be better to indicate this in legend instead of in the title.

I don't understand the mean of ***. Is it the p value associated to breed, Time and breed x time ?

You could indicate it by a sentence in legend.

Homogenize the unit with the text and the Tables.

ns : indicate the p value instead of not significant

Figure 2 :
Consider the same comments than Figure 1

Figure 3 :
Consider the same comments than Figure 1

Figure 4 :
Replace "challenge" by "tolerance test"

Figure 5 :
Replace "challenge" by "tolerance test"
Replace l by L for liter

Figure 6 :
Replace "challenge" by "tolerance test"
Replace l by L for liter