Recontrolling of reference values of hematological and clinical-chemical parameters in healthy sows of a high performance herd

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Introduction

The breeding of new races of slaughter pigs with higher meat percentage, changed conditions in feeding regime and housing as well as new laboratory measurement methods require a control of the existing reference values for swine.

This study is aimed to evaluate current hematological and clinical-chemical reference values and to compare them to existing reference values. The study results are controlled for influencing factors like gestation, lactation, season and age.

Conclusions

Activities of CK, AP, AST and concentrations of Cholesterol vary with gestation, parturition and lactation within the existing reference values.

Creatinine concentration lies above former reference limits and related publications. This is most likely due to the breeding of new races with higher meet percentage.

Lower AP activity is related to methodical differences, while we used a standardized system, which is best practice in human laboratory medicine. Reference values should therefore be corrected.

The other parameters did not vary.

Subjects, material and methods

Blood samples were taken from 60 sows of a high performance herd, divided seasonally into four groups, each consisting of five gilts and ten sows beginning in May 2005. The following scheme was used in each group:

Sample 1: 3 resp. 2 days prior to insemination (3-2 d a.i.)
Sample 2: 4 weeks after insemination (4 w p.i.)
Sample 3: 14 weeks after insemination (14 w p.i)
Sample 4: 1 day after parturition (1 d p.p.)
Sample 5: 1 week after parturition (1 w p.p.)
Sample 6: 2 weeks after parturition (2 w p.p.)

EDTA blood and serum samples were taken from the vena cava cranialis.The data were analyzed by means of SPSS[1].

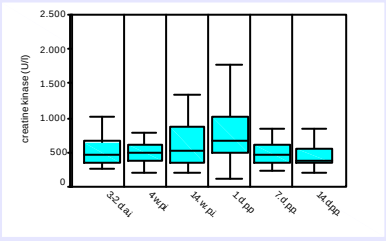
The blood count was determined in EDTA blood by means of the haematology automat ADVIA® 120.

Creatine kinase (CK), aspartate aminotransferase (AST), alkaline phosphatase (AP), and cholesterol (Chol), total protein (TP), albumin (Alb), urea, creatinine (Crea), calcium (Ca) and phosphate (Ph) concentrations in serum were measured with the analysis automat Hitachi 912.

[1] **Statistical Evaluation:**
The statistical evaluation of the data was conducted by means of SPSS. The normal distribution was tested using the Kolmogrov- Smirnov- Test. Concerning the descriptive part, the mean average and standard deviation were used in case of normal distribution, while the median and 1st and 3rd quartile were used in case of non-normal distribution. In order to test for significance, the folbwing test were applied: **Parametric tests** : variance analysis (ANOVA) including measurement repetition, paired ttest with Bonferroni correction (time series comparison); **Group series comparison:** t-tests for independent samples; **Nonparametric tests** : Kruskal-Wallis -Test, U- Test (Mann and Whitney), Friedman -Test as well as Wilcoxon- Test. For all tests, a significance level of p=0,05 was chosen.

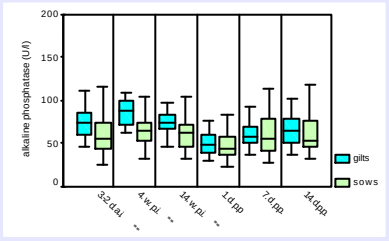
Results

1. Boxplots* CK for all sows



The **CK activity** varies in the course of the reproduction cycle (n.s.)

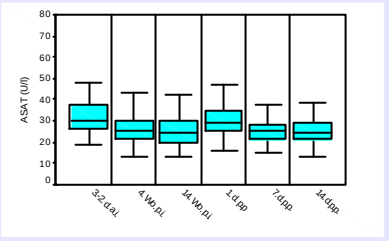
2. Boxplots* AP for Gilts and Sows



The **alkaline phosphatase activity is higher for gilts** than for sows **and varies** in the course of the reproduction cycle

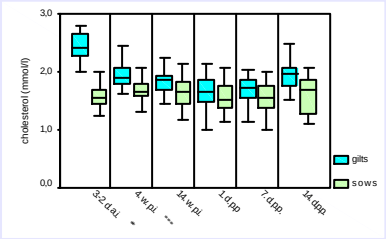
** is significant to 1 d.p.p.

3. Boxplots* AST for all sows



The **AST activity varies** in the course of the reproduction cycle (n.s.)

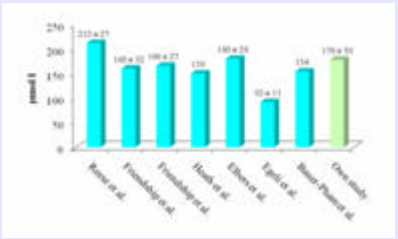
4. Boxplots* Cholesterol for Gilts and Sows



The **cholesterol concentration is higher for gilts** than for sows **and varies** in the course of the reproduction cycle

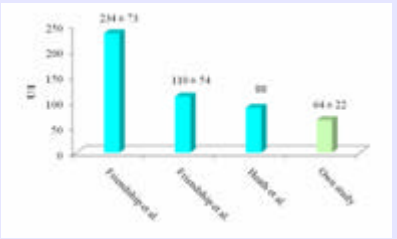
** is significant to 1 d.p.p. and 7 d.p.p. *** is significant to 1 d.p.p.

5. Comparison Crea Concentration Studies



Our results show a **higher creatinine concentration** compared to most existing reference values and related publications

6. Comparison AP Activity Studies



Our results show a **lower alkaline phosphatase activity** compared to existing reference values and related studies

* Median, 2nd and< 4th quartil, minimum and maximum