ANTIOXIDATIVE STATUS IN SOWS DURING THE PERIPARTURIENT PERIOD IN A FARM WITH A HIGH INCIDENCE OF MMA

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Objectives:

The mastitis, metritis, agalactia complex (MMA) in sow is the most important puerperal disease in the industrial pig production. The typical clinical picture with mastitis, metritis and agalactia has changed in the last years. Nowadays we see different clinical forms and courses which can vary from farm to farm. Because of the high economical relevance for the farms the most important way is to search for practicable possibilities for prophylaxis of MMA. From studies in other animal species is known that the antioxidative system can be variably stressed during pregnancy and lactation. This can have a significant effect on the health of the animals. In this study the underlying stress of the antioxidative system, especially superoxide dismutase (SOD), glutathione peroxidase (GPX), trolox equivalent antioxidative capacity (TEAC) and vitamin E, was investigated during the periparturient period in sows in a farm with a high incidence of MMA. Especially was tested if it is possible to get retrospective information about the susceptibility to disease.

Material and Methods:

Blood samples were taken four times during the periparturient period form 67 sows of a pig production farm in Thuringia. The parameters of the antioxidative status in the blood (SOD and GPX activity, TEAC and Vitamin E concentrations) were measured. The sows were divided in two groups, depending on whether they stayed healthy or fell ill for MMA.

Results:

The parameters of the antioxidative status of the sows with later MMA was different from the healthy sows even before parturition. The SOD activity (Abb. 1) was in ill sows one week ante partum significantly higher than in healthy sows. In contrast the GPX activity (Abb. 2) and TEAC concentration (Abb. 3) were significantly lower than in healthy sows. The Vitamin E concentration (Abb. 4) was in both groups one week ante partum nearly on the same level. After birth the SOD and GPX activity and the Vitamin E concentration decreased in the group with MMA. The TEAC concentration increased significantly one day after birth in the MMA group.

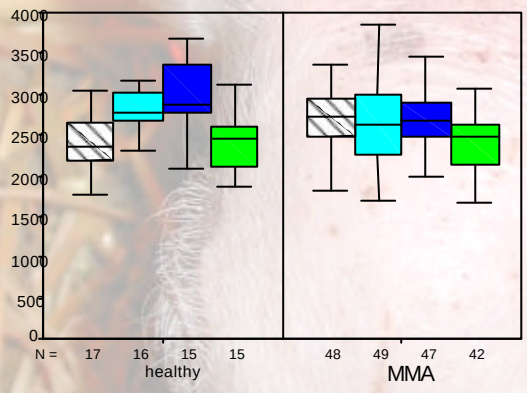

Abb. 1: SOD activity in sows in U/g Hb

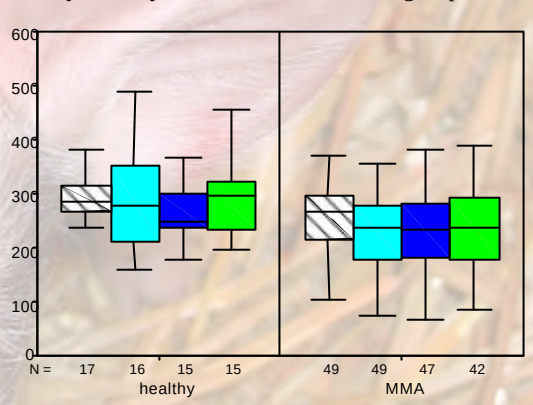

Abb. 2: GPX activity in sows in U/g Hb

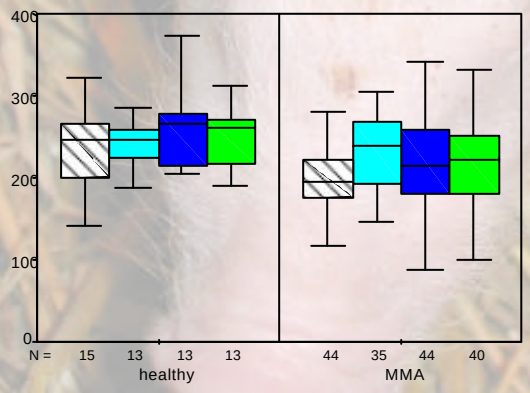

Abb. 3: TEAC concentration in sows in µmol/l

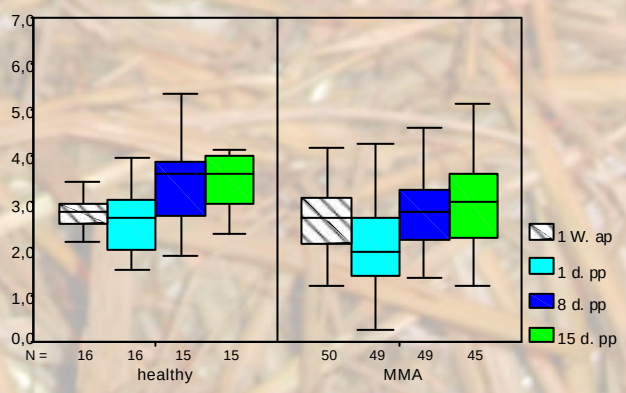

Abb. 4: Vitamin E concentration in sows in µg/ml

Discussion:

The high SOD activity one week ante partum indicates acute oxidative stress. The low GPX activity in MMA show the lack of general welfare. The reason for the decreasing Vitamin E concentrations one day after birth could be the beginning milk production. The results allow the conclusion that the antioxidative status of sows with later MMA is more stressed before parturition than in healthy sows. An important point to prevent the development of MMA is therefore a good management and a suitable feeding already before and during parturition to reduce possible stress for the sows.