# Differentiation of pork from healthy pig and the diseased dead pig

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## Introduction

Pork from the diseased dead pigs is very prevailing currently in the underdeveloped or developing countries. In order to protect the consumers from infecting the common diseases between human and animals the government establishes a rule to prohibit the pork from the diseased animals being sold on the market. The author just considers if no objective assay to differentiate the pork of the diseased pig from the healthy animals, it is too difficulty to prevent incidence of this problem. Thus, we have been working on this subject for several years, but it still can not be solved.

## Materials and Method

Sample collection and preparation: Healthy pork samples are obtained from the local market immediately after slaughter and loin is cut and placed in ice box, then brought back lab. The pork samples of the diseased dead pigs are obtained from the animal died of illness in a local pig farm. Eight samples from the healthy pigs are chilled at 4℃ for 1, 6, 12, 24, and 48 hr. In order to simulate the processing conditions for the pork samples from the diseased pigs, other eight samples of the healthy pigs are stored at 25℃
for 1, 6, and 12 hr, and then removed to 4℃ for another 1, 6, 12, 24, and 48hr for determination. The samples obtained from 13 head diseased pigs are used the same treatment as the healthy pigs.

pH value, conductivity-values, myoglobin and biogenic amines contents of the samples are determined to compare the difference between the healthy and diseased pork.

## Results and Discussion

Table 1 showed the changes in pH values of muscle samples from healthy and diseased dead carcasses. The result indicated that pH1 for the healthy meat stored at 4℃ was 6.41 and declined to pH24 at 5.73 with storage time, however, the pH values for the muscle samples from diseased dead carcass stored at 4 and 25℃ were at the range between 5.6 and 5.9. This figure is located between a normal course of pH change of meat postmortem, so it is hardly used to identify the meat from the diseased dead carcass.

Table 2 shows the conductivity value of the meat from the healthy and diseased dead carcasses stored at 4 and 25℃ for different times. The conductivity value for the meat from healthy pig was lower at the beginning but increased with storage time. Regardless, the meat stored at 4 or 25℃ the conductivity value was changed around 5

after 48 hr of storage. This value was very similar to that of the meat from the diseased dead carcass. Thus, it is also used as a reference value for identifying the freshness of meat only.

Table 3 indicated the result of changes in myoglobin content of meat from the healthy and diseased carcasses. It was found there were significant difference in myoglobin content between meat from the healthy and the diseased carcasses both stored at 4 and 25℃ for 1 hr. From the results of the Hunter Lab-value measurement it was found L-value of meat from the healthy carcass increased but a-value decreased with storage time. L-value of meat from the diseased carcass at 25℃,12hr increased remarkably, but a-value remained stably. However, there were significant differences in L-value of meat stored at 4 and 25℃ between the healthy and diseased carcasses. However, there were significant differences in the a-value of meat between the healthy and diseased carcasses stored at 4 and 25℃ for 1hr, but it tended to be the same values, consequently.

The results of biogenic amines determination indicated that the cadaverine content of the meat from the healthy carcass was lower than that of the diseased carcass, but no difference was found in the meat stored for longer time. However, as the cadaverine level increased above 7ug/g which can be identified as the diseased meat. Histamine was not detected in the healthy meat stored at 4 and 25℃, I hr postmortem, but it was detectable in the meat of the diseased meat and decreased with the storage time. Although the level of histamine for the healthy meat increased above 0.38ug/g that was the same as the value of diseased meat consequently, the measuring time was 24 hr postmortem. This condition does not occur on meat market, so it can ba used as an indicator for detecting the meat obtained from the diseased carcass. Tyramine could not be detected in the meat from the healthy and diseased carcasses at slaughter and early period, but it was detected when the storage time increased. The level of tyramine for the healthy meat was 5 times lower than that of the diseased meat. Therefore, as the tyramine content is above 0.23ug/g which can be identified as the meat from the diseased carcass.(The tables will be shown on the post).

Conclusion: In most cases, the time of meat obtained from the diseased carcass is longer time postmortem. It is fewer dead carcasses being slaughtered immediately at the time of death. The most of carcasses are placed in the ambient temperature preslaughter, thus, muscle tissue is going to autolysis. Therefore, the data obtained from this study may be used as indicators for differentiate the meat of the healthy animal from the diseased dead carcass.

**References**

H. L. Guo, R. C. Huang, M. T. Chen and D. C. Liu 2005. Comparison on conductivity and enzymatic acitivities between meat from normal and abnormal pigs.Taiwanese J.Agri.Chemistry and Food Sci. 43:444-459.

K. C. Yen 1986. Study on biogenic amines in Foods. Chinese J. of Agri. Chemistry 24:211-227.