

INVESTIGATIONS ON THE PROCESSING OF BOTH FROZEN AND CHILLED PORKS

AN AI JIA

Tianjin Food Research Institute, 26 Jinzi Highway, Nankai, District, Tianjin 300381, The People's Republic of China

INTRODUCTION: Frozen meat is now raw meat food for Chinese consumers purchase on daily life. According to Chinese people are accustomed to eat pork, frozen pork is major raw meat food to retail in the market in China. And a large proportion of raw meats retailed in the market in China are frozen pork. However today chilled meat for non-low temperature processing has become major raw meat food for consumers purchase usually in many developed countries in the world. There is no doubt that chilled meat will eventually replace frozen meat. In this paper, we mainly investigated some basic circumstances on the processing frozen pork and a change in quality during storage in China. Frozen pork is stored at -21°C freezing room and is different storage time which they are 0, 24hrs, one month, three months and six months respectively. We found that the pH value, peroxide value and acid value on frozen pork within storage have increased to some extent. Analytical results showed that frozen pork which stored at the conditions of temperature has gradually occurred a change in quality as storage time goes on. In addition, we also analysed a thawing problem of frozen pork and the characteristics of the chilled pork. So we consider that chilled pork is a developmental direction in China by our investigation and analysis.

RESULTS AND DISCUSSION: 1. A Change of Frozen Pork Within Storage — The carcass after slaughter was used to cut into two parts in the middle of the carcass. And then, going to freezing room at temperature -18°C for about 24 hrs, after that, goes to another freezing room at temperature -21°C. Generally speaking, frozen pork can be stored about 3 to 6 months at the conditions of -21°C. As everyone knows, a lower temperature conditions are common methods for storage on meat. Because they can inhibit or postpone speed of growth and multiplication of microorganisms. However the results in Table 1 showed that the pH of frozen pork has increased to 6.90 from initial 5.55, peroxide value were from 0 to 6.22 and acid value were increased to 1.43 from the beginning of 0.50. These figures indicated that frozen pork has gradually occurred a change in quality as storage time goes on. We are sure that frozen pork, even if stored at a conditions of lower temperature, can not be stored for a long time as well.

Table 1. A data of analysis on frozen pork, stored at -21°C, different storage time

storage time	pH value	acid value	peroxide value
0	5.55	0.50	0
24 hrs	5.70	0.55	0
1 month	6.00	0.828	0.313
3 months	6.46	1.30	4.20
6 months	6.92	1.43	6.22

Thawing Problem On Frozen Pork — Frozen pork is basically very hard carcass, in which the moisture of the carcass has been frozen into ice crystal state. According to Chinese traditional customs on daily life, most of frozen pork must be thawed before frozen pork retails, then going to the market to sell. Now thawing methods on frozen pork in China are mainly to combine soaking in water with natural environment. The aim of thawing of frozen pork is to make ice crystal of frozen pork inside into original moisture, so that the moisture after thawing was gradually sucked by muscle on meat to recover initial state before frozen. In fact, it is impossible about it, because a part of the moisture on meat can not be sucked up by muscle on meat after thawing, and the drip losses was separated within thawing of frozen pork. The drip losses contains some components which dissolve in water, vitamin, for example, salt and protein. And these components will be lost within thawing to decrease nutritional value and flavour on pork. In addition, because of the loss of the drip losses, a weight of pork also lost to some extent. We made a weight comparison between pork prior to frozen and pork post thawing, we found that a weight of pork post thawing lost about 5 to 7% than pork prior

to frozen. This is a considerable economic problem.

3. Energy Analysis — Frozen pork needs not only the processing condition of lower temperature, but also storage condition of lower temperature. It is obviously that frozen meat needs more energy than chilled meat. Investigated that frozen pork processed for each ton needs 55 to 60 Kwh, if chilled pork only 20 to 25 Kwh. Thus it can be seen, chilled pork processed would be able to save 1.5 times electricity than frozen pork.

4. Characteristics of Chilled Pork — Chilled pork is different from fresh pork. Fresh pork is meat after slaughter just. We usually call "hot meat". Hot meat usually does not process and is used to retail in the market in the countryside in China directly. So, we say that hot pork is fresh meat which is lower nutritional value as compared with chilled pork. However, chilled pork is meat for processed under the conditions of the temperature at 0°C to 4°C, 85% to 90% RH and homogenous air flow. Chilling processing is a ripening procedure of meat. Protein of meat can be resolved into amino acid by chilling procedure to improve nutritional value of meat. Also chilled pork have a good appearance, for example, white fat, fresh red colour, good tenderness and rich moisture in section of meat and special delicious after cooking. In addition to that above, chilled pork could develop a layer film on the surface of meats to prevent further environmental pollution and inhibit the growth and multiplication of microorganisms.

CONCLUSION: To develop and produce chilled pork first in China is necessary for meeting the needs of Chinese consumers on daily life. We are sure that chilled pork must be able to occupy the market in China soon. So we can say that chilled pork are good quality of fresh meats with good taste and appearance. For further studying on chilled meat, we would like to discuss chilling and storage temperature during processing as well as we would be able to have a long storage-life in future. It would relate to the problems on biochemistry and microbiology on meat.

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