

providing optimum condition for microbial multiplication. Also, meat at higher temperatures does not facilitate proper cutting and palatability. If we chill the meat after buying it from the processing unit, we can reduce these damages to the meat.

Why aging is needed?

Subsequent to the completion of rigor mortis, another phase set in called 'resolution' of rigor mortis during which a decrease in tension arises with the lapse of time postmortem. The resolution of tension takes place not because of breaking of actomyosin bonds but due to events other than that such as proteolytic degradation of specific myofibrillar proteins and loss of ultra-structural integrity. When the chicken carcass and primal cuts are kept at refrigeration temperature (2°C to 4°C) for various lengths of time on their usage usually for about 24 hours, many changes take place that alter meat properties most notably the tenderness and juiciness. This process of holding chicken at refrigeration temperature for extended periods following initial chilling is called 'aging'.

How to increase flavour and aroma?

Many of the psychological and physiological responses experienced when meat is eaten are elicited by products' flavour and aroma. Flavour and aroma sensation arise from a combination of factors that are difficult to separate. Some evidence shows that inosine monophosphate and hypoxanthine, breakdown products of ATP, impart flavour and aroma. This may explain the higher intensity of flavour found in frequently used muscles and some game animals. In Indian condition, the liking for

drumstick from chicken is mainly due to the above fact. In addition to the above breakdown product formed during delay phase of rigor mortis, some more flavour enhancing products are also formed from destruction of mononucleotides during aging. Thus the aging of chicken also influences flavour and aroma of meat.

Therefore, the poultry carcass from the exsanguinated birds should be allowed to go through the normal rigor mortis process and then keep the same at refrigerated temperature for aging to get improved tenderness and more juiciness and flavour from meat during cooking. This will give more satisfaction from chicken eating than what we are getting now!

Points to Ponder

- Do not cut chicken to pieces immediately after slaughter and dressing.
- Keep the chicken in refrigerator for at least 4 hours before cutting and further processing.
- Chilled/aged chicken are more tender and palatable.

Compiled by:

S.Vaithyanathan
M. Muthukumar
V. V. Kulkarni

Published by :

Director
National Research Centre on Meat
Chengicherla, Boduppal P.O. Hyderabad-500 092
Phone:040-27204541, Fax:040-27201672
Email: nrcmeat_director@yahoo.co.in
www.nrcmeat.org.in



Tasty and tender chicken: Ways and means ...



National Research Centre on Meat
(Indian Council of Agricultural Research)
Chengicherla, Boduppal P.O.
Hyderabad-500 092

Chicken is largely consumed in our country as freshly slaughtered, dressed, cut into pieces and cooked without delay in the process. Does it result in best enjoyable chicken? It is often complained by housewives that even young broiler chicken is not tender, juicier and does not provide enjoyable product. Why the chicken meat in such quick processes is tougher, less juicier and less palatable? What is the alternative? Adoption of simple scientific practices in the chicken meat processing and cooking will improve the quality attributes. Just as beauty is in the eye of the beholder, meat must please the eye as well as the palate of the consumer. The main factors contributing to the overall eating quality of meat are viz. colour & appearance, texture, juiciness, flavour. Of these, texture is probably considered the most important by the average consumer. The eating satisfaction results from the interaction between tenderness, juiciness and flavour.

Why do we eat chicken?

We eat meat for its taste, nutrition, and delicacy. It gives some extra happiness after eating. Most people eat meat mostly on some special occasions like weekends, to treat guests and on festival days. However, some consume everyday or at least thrice a week. In all these occasions we expect more satisfaction from eating chicken dishes. Following scientific method of meat processing would ensure good quality meat.

Consumer preference in India

Basically, we prefer the wet market that means over the counter we buy the chicken meat immediately after slaughter and dressing of the birds. The eating quality of this meat may not satisfy a consumer when

compared with supermarket chicken obtained after completion of 'rigor mortis' and tenderization. Chicken should be cut into pieces only after completion of 'rigor mortis' and 'resolution' of rigor mortis to get the desired meat quality and to get more eating satisfaction. A delay of 4 hours before dressing and cutting into pieces is required.

What is the need to wait after dressing and before cutting and cooking?

Meat consumers have been using animal tissue for food with little regard to their function in the living body, or the extent to which those functions affect food quality. Muscles obtained from the exsanguinated animal do not suddenly terminate all their living functions and become meat. Instead, a number of physical and chemical changes take place rather slowly over a period of several hours after slaughter, before the conversion of muscle to meat.

What is Rigor mortis

One of the most dramatic post mortem changes that occur during conversion of muscle to meat is stiffening of muscles (also known as rigor mortis) after death. This phenomenon is due to the formation of permanent or irreversible cross-bridges in muscle between actin and myosin filaments. In the living animals, the same chemical reaction takes place with the formation of actomyosin bonds during muscle contraction. The difference is that relaxation is possible in the live animal with the continuous availability of energy to break the bond so as to allow the muscle to return to its relaxed state or original length.

During the period immediately after exsanguination, the muscle is quite extensible due to the limited availability of

energy rich muscle glycogen. The period of time during which the muscle is relatively extensible and elastic is called the delay phase of rigor mortis.

As the stored glycogen is exhausted in a short time, actomyosin bridges begin to form, and the muscle gradually becomes less extensible when an external force is applied. This process signals the onset phase of rigor mortis. It lasts until the completion of rigor mortis. Once the muscle becomes relatively inextensible, rigor mortis is complete. The time required for chicken muscle to enter the onset phase of rigor mortis is less than 30 minutes. So what the chicken consumer buys from the chicken mart, as chicken from the freshly slaughtered birds is only the muscle before converting into meat. The actual completion of rigor mortis which takes about 4 hours is essential to convert the muscle into meat, wherein the muscle is relatively inextensible that means the length of muscle becomes constant.

Why we should not cut chicken into pieces soon after dressing?

During rigor mortis attachments of meat to bone keep them extended thereby reducing the stiffening. Also, due to availability of energy severe contraction of cut muscle occurs resulting toughness of meat. Hence to get more tender meat cut the chicken into pieces after rigor mortis.

Why chilling is needed?

During the course of processing of broilers to obtain meat, the birds are subjected to heat treatment to remove feathers and skin. The temperature of poultry carcass after defeathering and cleaning will be around 35-45°C. This heat along with heat generated during chemical reaction going in muscle on the onset of rigor mortis will deteriorate the meat condition by