

# The Main Ingredient

MALABAR

A Bi-Monthly Newsletter from Malabar Super Spice Co. Ltd. March/April 2012

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[www.malabarsuperspice.com](http://www.malabarsuperspice.com)

## Upcoming Events

May 9 to 11, 2012

### SIAL Canada

Palais des Congres  
Montreal, QC

[www.sialcanada.com](http://www.sialcanada.com)

May 27 to 29, 2012

### Canadian Institute of Food Science and Technology 50<sup>th</sup> Conference & Expo

Niagara Falls Convention Centre  
Niagara Falls, ON

[www.cifst.ca](http://www.cifst.ca)

May 30 to June 1, 2012

### Canadian Meat Council's 92<sup>nd</sup> Annual Conference

Fairmont Le Chateau Frontenac  
Quebec, QC

[www.cmc-cvc.com](http://www.cmc-cvc.com)

August 12 to 17th, 2012

### International Congress of Meat Science & Technology (ICoMST) 2012

Hilton Montreal Bonaventure  
Montreal, QC

[www.icomst2012.ca](http://www.icomst2012.ca)

## THE MEAT OF IT:

## IT ALL BEGINS WITH MEAT QUALITY

*We receive regular inquiries from our customers regarding meat quality asking how they can improve meat texture and functional components. The key begins before the meat is processed...*

### What is Meat Quality?

A definition of meat quality often depends on who you ask – the meat producer, the meat processor or the consumer? In general there are a number of factors that may be considered including meat tenderness, juiciness, taste, appearance (colour), price, and food safety. For the consumer, it is often the meat colour that determines the initial buying choice, and then meat tenderness that's important during the eating experience. (We'll be covering meat colour in an upcoming issue.)

For meat scientists and processors, however, factors affecting meat quality include pH, colour, water-holding capacity and intramuscular fat.

One key influencer of meat quality begins with the slaughter process (and its effect on pH).

### About Meat

The major component of meat is lean, which is made up of muscle fibres. Lean meat consists of approximately 72% water, 20% protein, 7% fat and 1% ash. The muscle proteins are the components in the muscle fibre that bind water, affecting both meat tenderness and juiciness. Meat colour is embedded within the muscle fibre as a result of the pigment-containing proteins (including myoglobin) that are able to either absorb or reflect light.

*continued on page 3*

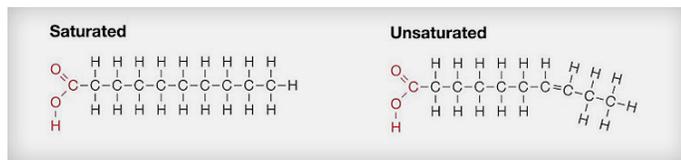
# FROM THE LAB

## Fat & Meat Quality

*The fat in meat provides essential fatty acids and vitamins, plays a key role in the sensory perception of juiciness, flavour and texture, and also directly affects shelf-life.*

### What is fat?

Fat, in the form of triglycerides, (glycerol molecules with 3 fatty acids attached), is found around the muscles of the animal. Fat can be deposited intramuscularly as marbling, or contained between muscles, or as external (subcutaneous) fat. Fatty acids (lipids) also differ based on their number of carbon atoms and number of unsaturated bonds in the carbon chain. A single bond between carbons is called a saturated bond and a double bond is called an unsaturated bond.



### Hardness and Softness of Fatty Tissue

Differences in lipid softness can be a result of differences in animal feeding. Within the animal, the softer fats are located furthest from the centre of the animal - internal body fats are hardest, and the outer layer of pork back fat is softer than the inner layer. Comparatively, chicken fatty tissue is extremely soft, pork is soft to moderate, and beef fatty tissue is hard (with little connective tissue).

Soft fat has more, and stronger, connective tissue, making it more resistant to damage during grinding, resulting in lower cooking losses. For example, the average cooking loss for jowl fat is 20 – 26% compared to hard back fat at 49 – 73% (Ranken, 1984). The subcutaneous fats from pigs are the best suited and most widely used in meat processing, which includes back fat, jowl fat and belly fat.

Melting of fat occurs at approximately 35 – 40°C, depending to a certain extent on the type of fat.



### Common Problems

Fat rancidity due to oxidation is a major processing concern, both for raw and precooked meat products. The oxidation of fats is caused by a biochemical reaction between fats and oxygen, and one of the reaction products is butyric acid which causes the typical rancid taste. Oxygen is eight times more soluble in fats than in water. Softer fat (e.g. pork) is more prone to rancidity than beef, as pork fat has more unsaturated fatty acids compared to beef or lamb. It is also important to note that fat oxidation occurs spontaneously and is not stopped when meat is frozen.

Fat caps or fat pockets can form during sausage processing as a result of excessive chopping (in the cutter), the cutter temperature being too high, or for cooked products where it is cooked too fast.

The information provided is accurate and reliable to the best of our knowledge, but is offered solely for consideration, without warranty or guarantee.



## Did You Know?

### Pork is Hot!

Hog futures have been rising as many consumers choose pork over more expensive beef, which is selling near an 8 year high.

**90.4 cents** – price per pound of lean pork on the Chicago Mercantile Exchange (in US dollars), on March 2, 2012.

There has been a 7% increase in the price of pork over the past 12 months.

In all, 21.1 million hogs were slaughtered in Canadian packing plants in 2010.



As sheep casing prices continue to rise, are you looking for an alternative? Try our CRQ 24 collagen casings, with a natural curve when stuffed and a great traditional “bite”.

Call us for details.



## Did You Know?

Heavy metals (iron, lead, copper, etc) will accelerate rancidity development in meat, and therefore hard water should not be used in processed meat production.

## Meat Tenderness

Meat tenderness is one of the most important factors in meat quality. There are a number of considerations that will affect meat tenderness, including the following:

Stress prior to slaughter (long transit times, exposure to extremes in temperature, extended periods without food or improper handling) is one of the most important influences on ultimate meat tenderness. When an animal is slaughtered, dramatic changes occur in the muscle.



## pH

Glycogen is the energy source that is stored in the muscles, and after slaughter its substrate, glucose, is converted into lactic acid, causing a drop in pH. The pH of muscle is a measurement of acidity, and in a normal living muscle the pH is 7.0 – 7.2. At rigor mortis, the pH falls to 5.5 – 6.5, in a process called glycolysis. It is important that the glycogen levels in the muscles of the slaughtered carcass are as high as possible, in order to develop the maximum level of lactic acid in the meat. The ideal pH level measured 24 hours after slaughter should be below 6.2. Lactic acid in the muscle has the added benefit of retarding the growth of spoilage bacteria.

## DFD (Dark, Firm & Dry) Condition

Animals exposed to long-term pre-slaughter stress have reduced glycogen supplies at slaughter, and the pH drop does not proceed at a normal rate at the onset of rigor mortis. This condition can be found in carcasses of cattle (sometimes termed as “dark cutting”) or sheep, and sometimes pigs and turkeys. The meat is darker in colour and has a firm (dry) texture as well as a less pronounced taste. Due to the higher pH (6.4 – 6.8), DFD meat will spoil more rapidly.

## PSE (Pale, Soft & Exudative) Condition

Animals exposed to short-term stress (nervous excitement at the time of slaughter) experience a rapid drop in pH due to higher glycolytic activity. (Not abnormally low, but reached quickly while the carcass is still warm.) The combined effect of a lower pH and protein denaturation reduces the water holding capacity of the meat, and the result is a softer, less firm meat. This condition occurs mostly in pigs.

DFD and PSE meat are safe to eat, but their functionality for further processing is compromised. PSE meat will have higher drip and cooking losses due to their reduced water-binding capacity and the meat flavour is reduced. DFD meat is more suitable for scalded/boiled sausages, but the meat flavour is also weaker.



## Effects related to Rigor Mortis

At slaughter, there is a release of energy within the muscles which causes contraction, referred to as rigor mortis (the Latin term for “stiffening after death”). After a period of time (depending on the animal species) the muscles will again relax, and there is a resolution of rigor mortis. If the rigor-resolution sequence is interrupted by cutting, chilling, freezing or cooking, then toughness may occur.

If the meat is cooked when the muscles are still in rigor, it will be extremely tough.

Cold shortening (or cold-induced toughening) may occur with rapid chilling of the carcass, resulting in a significant decrease in the tenderness of the muscles. The muscle contraction during rigor mortis is controlled by the calcium concentration, which increases when the muscle is chilled rapidly, and the muscle fibres then contract more rigorously than normal. The result is as much as a fivefold increase in meat toughness. This is of particular concern with sheep and cattle, but not normally with pigs or poultry. Delayed chilling and electrical stimulation are 2 possible remedies.

Thaw rigor is a condition that occurs when the meat muscle is frozen pre-rigor (before the meat pH has fallen below 6.2). When the muscle is thawed, strong contraction with toughening of the meat will occur. If the frozen meat is stored for a longer period (months) the thaw rigor effect is reduced.

Several methods are used to reduce the toughening effect:

- 1. Electrical Stimulation** - Passage of an electrical current through a carcass immediately after slaughter, speeding up the onset of rigor mortis. This process is used for lamb and beef, without any negative effect on processing quality.
- 2. “Hot Boning” Meat Processing** - Carcasses or sides are not cooled before they are boned (usually done 40 – 45 minutes after slaughter), with an optional added salt treatment. During hot boning, slaughtering, boning and packing of the meat is done in a single working day. The disadvantage is that there is an increased risk that the meat can support the growth of pathogenic bacteria as it cools. (Meat must be cooled quickly to below 7°C after boning.)

There are many minor influences that can also affect meat quality, but to a lesser degree, including the influence of genetics, the kind of pasture being grazed, and the animals diet. After slaughter, influences may also include fat composition and marbling.

Quality will always be a meat industry issue. For meat processors, it is important to understand that meat quality is influenced by a number of factors established before the meat is cut & processed. The best quality meat comes from healthy, well fed, unstressed animals, and a fully integrated meat production system is required to assure consistent quality from slaughter to table.

## References

- Meat Processing Improving Quality, J. Kerry, J. Kerry & D. Ledward, Woodhead Publishing Ltd. 2002  
Handbook of Meat Product Technology, M.D. Ranken, Blackwell Science Ltd. 2000



# Supplies for Spring



It's a fact that we're not just about spices and seasonings! Did you know that we also stock meat processing supplies? Here are a few you'll need as BBQ season approaches:

### Artificial Casings

Commonly made of fibrous collagen, cellulose, and more recently, polymer/plastic. Malabar sources artificial casings from across the globe, to bring you the very best for use in your products.

### Skewers & Trussing Bands

Secure your BBQ ideas with skewers and trussing bands.

### Butcher Twine

#20 unpolished & polished 2R, 4R and 6R.

### Poly Clips

We carry both the S740 and S744.

For more information, call us at **1-888-456-6252 (MALA)** or visit our website at **www.malabarspices.com**



## OUR PRESIDENT'S Message

As the Canadian meat industry continues to increase production and expand into global markets, it is unfortunate to see the media continue to publish negative articles that criticize meat products and the value of meat consumption. The misinformation and disregard for the facts is a sad reflection on the media's disregard for the key role that they play in consumer education.

The nitrite debate, "pink slime" meat products and the push to remove meats from our diets continue to make media headlines (without any scientific support). Consumers, meanwhile, continue to look to the media as a source of reliable information. When media outlets don't accept this responsibility, it results in an extra burden on the meat industry to provide the facts, and the extra hurdle of teaching consumers who believe that they already know the "truth".

Here are some informative links to assist you, our customers, to better educate your customers.

[www.canadabeef.ca](http://www.canadabeef.ca) | [www.meatami.com](http://www.meatami.com)

All the best, from Malabar.

**Doris Valade**  
President  
Malabar Super Spice Co. Ltd.

## Did You Know?

The oldest continuously trading family business in the United Kingdom is a butcher shop - **RJ Balson & Sons**, which started trading in 1535, when Henry the 8<sup>th</sup> was still on the throne.



Trading for 476 years, and 25 generations, its founder John Balson started with a market stall, and today shoppers as far afield as North America can buy Balson's British bangers online at [www.rjbalson.co.uk](http://www.rjbalson.co.uk).



For more information on any of the subjects covered in Malabar's newsletter, or to suggest topics you'd like to see covered in future editions, please contact Sara Alexander at [marketing@malabarspices.com](mailto:marketing@malabarspices.com). Look for our next edition in May/June 2012.

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