



DANISH MEAT
RESEARCH INSTITUTE

High pressure processing of meat products is a part of a major cooperation project called "New gourmet pork products achieved by molecular comprehension of alternative breed and high pressure processing" 2009-2012. The Agriculture Scientific Faculty at University of Aarhus, The Faculty of Life Science at University of Copenhagen and Danish Meat Research Institute have received subsidies from the Ministry of Food, Agriculture and Fisheries, 'Svineafgiftsfonden' and 'Promilleafgiftsfonden' to the project.



High pressure processing of meat

- Possibilities and limitations

Further information: Danish Meat Research Institute

Jakob Søtoft-Jensen
JSJN@teknologisk.dk
Tel. : +45 7220 2757



DANISH MEAT
RESEARCH INSTITUTE

Maglegaardsvej 2
DK-4000 Roskilde
Tel. +45 7220 2000
Fax +45 7220 2744
e-mail dmri@teknologisk.dk
www.dti.dk



Danish Meat Research Institute

High pressure processing of meat

The technology of high pressure broke through commercially in the meat industry around the turn of the millennium. Newest trend is to utilize high pressure as an active processing method which exploits the gentle technology to preserve as well as to create new products.

Sausages with less salt

By the use of high pressure it is possible to produce sausages that are

- Good when it comes to color and water binding capacity
- Reduced in content of salt and phosphates
- Spreadable like tea sausage
- Sliceable if the sausages are heated to 40°C before and during high pressure processing

Marinated meat with longer shelf life

High pressure processing of meat marinated with spice pickle results in

- Better preservation of quality in existing shelf life period
- Possibility of 2-3 weeks longer shelf life
- Light greyish coloring of the surface of the meat
- Altered textural properties



If the meat is eaten after cooking it will be more crumbly, dry and hard. However if the high pressure processed meat is eaten directly from the refrigerator the texture is soft and delicious and in this way it creates the possibility of

- Development of new meat products like carpaccio

Ready meals in cold storage

High pressure processing of casseroles enables

- Cold storage instead of frozen

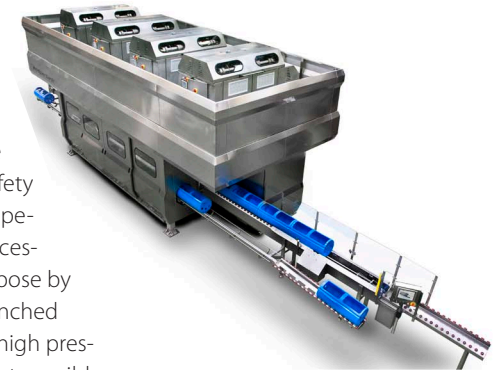
A study showed that when the ready meals were served to the consumers there were no difference between high pressure processed and not-high pressure processed meals. This underlines a promising potential for high pressure processed products.

Not a wonder drug

High pressure does not result in complete elimination of all types of bacteria. Pathogenic bacteria as for instance Listeria and Salmonella are substantially reduced whereas spores are hardly affected. There are always spoilage bacteria which will survive – often in stressed condition. The number of surviving bacteria varies but sooner or later they will grow and affect the shelf life or food safety.

Works on sliced meat

For retail packed sausages and sliced meat the ability of high pressure to decontaminate is well documented and commercially tested. In these matters the technology increases the shelf life and safety without noticeably affecting taste and appearance. Optimization of recipes can be necessary. The method is approved for the purpose by the American food authorities. Newly launched and patented equipment has also made high pressure processing of overlapping sliced meat possible in modified atmosphere packed in common packing material.



Facts of high pressure processing

- Packed meat is placed in a chamber with water where the pressure normally is increased to 6.000 atm in 2-6 minutes. Overall processing time is normally 7-12 minutes
- In fresh or marinated meat the texture, water binding capacity and color is affected
- In cooked or drycured meat products there are none or insignificant changes
- >160 commercial industry plants exists over the world - 30 % within meat industry
- The costs of high pressure are about € 0.16/kilo meat all included
- The capacities are up to 2,2 ton/hour per plant
- High pressure equipment for modified atmosphere packing is launched
- There are mainly three suppliers of equipment in EU and USA and a new one from The Far East