

FOOD TECHNICAL SERVICES

PROJECT: VENISON CHORIZO DEVELOPMENT AND GOVERNMENT APPROVAL

Use of Food Technology in product development - venison meat culturing and curing

Background:

A supplier of wild venison products, in the early stage of developing a range of cultured cured dried raw ambient stable venison sausages requested our assistance with: a) Process development, b) Support with presenting the Food Safety Authority with appropriate information on controls & validations in order to permit approval to sell. We agreed to help.



Summary of the final processes developed:

Such products have been around for centuries, but only recently has the science become well understood and the processes better controlled. The process appears as a fairly complex series of interrelated steps:

- Mincing and mixing of meat fat spices and water in the appropriate proportions.
- Adding to that mix, the microbial culture (specific strains of lactobacillus staphylococcus and Pediococcus) pre mixed with fermentable sugars so that as a “already active culture” they can quickly begin:
 - o Developing lactic acid with a corresponding fall of the pH,
 - o Competing with & inhibiting resident bacteria (which may include spoilers/pathogens),
 - o Developing colour flavour and texture changes to the meat.
- Then adding curing chemicals (salt, nitrate, nitrite), after which the cultures begin to reduce nitrates into nitrites – and so contribute further to the process by:
 - o Inhibiting both: a) pathogen/spoilage bacteria and b) oxidation damage to the product,
 - o Creating desired colour and structural/textural changes to the meat proteins.
- Temperatures are controlled to achieve culture growth that results in predetermined set points of pH so that pH:
 - o Falls rapidly enough to make the mix resilient to growth of pathogen species associated with raw meat.
 - o Falls are slow enough so as not to harm the textural properties and eating quality of the final product.
- The fermenting sausage mixture is filled into skins which are then hung to continue fermentation/cure.

At this stage both air humidity and temperatures are controlled such that:

- o Air starts moist & warm - to aid culture activity creating further falls in pH and a rise in nitrite.
- o Air then becomes drier - bacterial activity slows, and drying becomes the main activity.
- o Drying rates are controlled to avoid formation of a pellicle, as any resultant moist areas could be unsafe.

Progress is monitored to ensure safety/quality parameters are met - by measuring: Rate of pH and moisture drop.

- Drying ends & product is packed when the moisture (ie water-activity) is low enough to halt microbial activity.
- As ruminant meat is theoretically susceptible to carrying pathogenic acid tolerant E.coli, it was thought prudent to positive release each batch on microbe test results.

Process and product approval:

A thorough HACCP based system was developed and staff given appropriate training. The local Environmental Health team were provided with application and documentation that demonstrated that processes & hazard controls were suitable, properly controlled monitored recorded & validated.

Full approval to make/ launch/sell ambient stable cultured cured dried venison product was given.

