

Novel starter cultures for meat and meat products (dry sausages) and their shelf stability: Review

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The purpose of this study was to select the suitable bacterial strains for use as a starter culture for producing fermented meat products. *Micrococcus roseus* (MTCC-1532), *Lactobacillus plantarum* (MTCC-1407 and L-89) and *Pediococcus acidilactici* (NCIM-2292 and NCIM-2293) were examined for their ability to grow in the presence of sodium chloride, sodium nitrite, sodium nitrate and at different temperatures. Their ability to ferment different carbohydrate was also assessed. These hurdles were used alone and in combination. *M. roseus* (MTCC-1532), *L. plantarum* (MTCC-1407) and *P. acidilactici* (NCIM-2293) were able to grow well at 13°C and 16°C in the presence of 3% NaCl, 0.12% sodium nitrite and 0.08% sodium nitrate indicating their suitability as starter cultures for production of dry fermented sausages with the blend of Pork and Buffalo meat. Good quality dry sausages were prepared by ripening them at controlled temperature with selected pure bacterial cultures *L. Plantarum* (MTCC-1407) + *P. acidilactici* (NCIM-2293) + *M. roseus* (MTCC-1532) in equal proportion. Dry sausages are shelf stable fermented meat products which remain safe and stable without refrigeration. They are well suited to the Indian climate and take care of several health hazards associated with most of the meat and meat products. Good quality dry sausages were prepared by ripening sausages at controlled temperature with a selected combination of pure bacterial cultures *L. plantarum*, *P. acidilactici* and *M. roseus* in equal proportion. These starter cultures effectively inhibited the growth of *S. aureus* and Coliforms. The count of Lactic acid bacteria (LAB) and Micrococci was found to be higher in the sausages prepared by using above mentioned starter cultures.

The Coliform count of fresh meat used for making sausages was 6.47 log cfu/g which reduced on 10th day to a level of 2.95 log cfu/g in sausage made with starter cultures. Coliforms were not detected in these sausages on 20th day of ripening. Coliforms were present during the ripening period in the sausages made without starter cultures. *S. aureus* was initially present in the fresh meat used for making sausages but was reduced to zero on 10th day of ripening in sausages made with starter cultures. *Cl. botulinum* was found to be absent in all variants of sausages at all stages of processing and storage. It was also not detected from fresh meat sample. Yeast and Molds count decreased significantly on 2nd day of ripening but increased gradually on 30th day of ripening but lower than that of their control. Mold growth was observed to be less in the smoked sausages as compared to unsmoked sausages.

This was due to inhibitory effect of smoke on the mold growth. The dry sausages were found to be storable for 30 days at ambient temperature.

Introduction

Starter societies or starters are individual or blended definitions of those strains in with a specific enzymatic action that when included a characterized fixation to a substrate change it into a food item with explicit qualities. This idea applied to meat items could be portrayed as feasible microorganisms that can duplicate themselves inside meat items, expanding their conservation, controlling their sterile security, and potentiating their agreeableness by shoppers, keeping up or improving their wholesome quality. The primer utilization of starters in meat items came about because of including a segment of the last meat items to their crude materials, implying that piece of the as of now matured cluster of wiener was tossed again into the new blend. This previously aged item contained the fundamental microorganisms to begin the aging of the new cluster. This is known as back-slopping or back-vaccination. Fermented meat products may be manufactured without the use of starter cultures, although their use can help to ensure safety, standardizing product properties (including flavour and colour), and shorten the ripening period. Nevertheless, well-adapted and qualified presumption of safety (QPS) strains must be used and the establishment of the starter culture must be verified in order to guarantee the expected performance.

Probiotics are live microorganisms that give a medical advantage to the host when controlled in sufficient sums. Probiotics have been utilized in food items, food enhancements, and pharmaceutical items. Because of expanding worries over wellbeing, probiotic nourishments (e.g., probiotic dairy items) are currently acknowledged on the planet advertise. As of late, the chance of creating probiotic meat items has been talked about. By utilizing probiotic starter microorganisms, potential medical advantages can be acquainted with meat items and it is as of now conceivable to create probiotic meat items. By the by, the conceivably gainful impacts on human wellbeing from eating a probiotic wiener despite everything need affirmation.

The starter bunches utilized these days in meat industry are, by request of significance, lactic corrosive microscopic organisms (LAB), Gram-positive catalase-positive cocci (GCC+) (for the

most part staphylococci), molds, and yeasts.

Lactic corrosive microscopic organisms (LAB) are a gathering of Gram-positive microbes having a place with the Formicates. They are catalase-negative, either bar molded (bacilli) or round (cocci), described by an expanded resilience to sharpness (low pH extend), and have a low GC (guanine-cytosine) content. Albeit numerous genera of microbes produce lactic corrosive as an essential or optional final result of aging, the term lactic corrosive microorganisms (LAB) is expectedly saved for genera in the request *Lactobacillus*'s, which includes *Aerococcus*, *Carnobacterium*, *Enterococcus*, *Lactococcus* and *weissella Lactobacillus*, *Leuconostoc*, *Gonococcus*, *Pediococcus*, *Streptococcus*, *Tetragenococcus*, *Vagococcus* As food maturation specialists LAB are engaged with making yogurt, cheddar, refined margarine, sharp cream, frankfurter, cucumber pickles, olives, and sauerkraut, a few animal groups may ruin lager, wine, and handled meats.

Gram-positive catalase-positive cocci (GCC+) are the second most significant gathering of meat starters and are made out of nonpathogenic coagulase-negative staphylococci (CNS). The most significant starters from this gathering are strains having a place with the genera *Staphylococcus* and *Kocuria*.

Toward the start of the aging procedure, the surface mycobiota is for the most part made out of yeasts; in any case, as diminishes, molds outcompete yeasts and prevail in the last item. Molds colonize the outside of aged meat items, now and again presenting specific qualities, nonetheless, in different cases being viewed as indications of deterioration.

Yeasts are trademark segments of the mycobiota developing on matured hotdogs. Their cause is essentially identified with the earth and to the meat utilized as crude material, since yeasts are normally found on new meat. The most well-known genera are *Candida*, *Rhodotorula*, *Debaryomyces*, and *Trichosporon*. In matured meats, the lactic corrosive created by LAB changes the earth, preferring the improvement of yeasts, which utilize the entirety of the supplements and vitality and develop quickly.

Meat protection by maturation has been completed for a great many years, yet the possibility of starter societies was first presented for dry wieners during the 1940s with Patent. The main business starter culture was a strain of *Pediococcus acidilactici* that was made accessible in the US in 1957. In Europe, the primary starter culture to be presented was strain M53 from the sort *Kocuria*, disconnected from a Finnish wiener, which was utilized to forestall shading and smell absconds.

Starter societies assume a fundamental job in the assembling of aged food items. Starters made out of LAB strains produce the lactic corrosive that follows up on meat proteins changing their water awaiting limit, in this manner adding to surface, dampness substance, flavor, and smell of the items, and authoritatively follows

up on its microbiological security. Moreover, microbial substances, to be specific, bacteriocins, delivered by Gram-positive types of the LAB gathering, such as, nisin and different antibiotics or pediocin-like bacteriocins, have an antimicrobial job with an impact on safeguarding and wellbeing.

Starter societies have various advantages: (i) They are of known amount and quality. (ii) They lessen the aging time. (iii) They increment wellbeing by outcompeting unwanted microorganisms. (iv) They empower the assembling of a result of steady quality throughout the entire year in any climatic zone, as long as legitimate regular conditions or aging/drying chambers are accessible.

The point of the current survey is to refresh the information on the utilization of starter societies in conventional meat items, with center around dry-aged items.

In this original copy, we will attempt to offer responses to some pertinent inquiries regarding this matter, through the examination of distributed investigations with some applied outcomes. Which starter societies are utilized and why?

Starter Cultures in Dry-Fermented Meat Products

The first generation of meat starter cultures was generally based on microorganisms isolated from vegetable fermentation, such as *L. plant arum* and members of the genus *Pediococcus*. Then, a second generation of starter cultures comprising meat-borne strains, such as *L. skein* and coagulase-negative staphylococci (CNS), was developed, harbouring phenotypic traits of technological relevance. More recently, efforts have been dedicated to the study of the physiological and technological properties of LAB and CNS isolated from traditional fermented sausages, in order to develop functional starter cultures that enhance safety and nutritional advantages while maintaining industrial performance.

Conclusion

Meat protection by maturation has been completed for a great many years, yet the possibility of starter societies was first presented for dry wieners during the 1940s with Patent. The main business starter culture was a strain of *Pediococcus acidilactici* that was made accessible in the US in 1957. The point of the current survey is to refresh the information on the utilization of starter societies in conventional meat items, with center around dry-aged items.