Research Progress of Fermentation starter culture on Fermented Sausages

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Keywords: fermented sausages; fermentation starter culture; research progress

Abstract. Authors summarized fermented sausages the origin, development, species and the role of microorganisms. At the same time, we discussed the fermentation starter culture and its prospect.

Introduction

Fermented meat products refers to the livestock and poultry meat in the natural or artificial control conditions, the specific beneficial microbial fermentation or the role of enzymes, resulting in a series of biochemical changes and physical changes made after the processing a class of meat products [1]. At present, the fermentation meat products are fermented sausage and fermented ham two categories [2].

Fermented sausage, also known as raw sausage, refers to the minced meat (often refers to pork or beef and animal fat with sugar, salt, starter and spices mixed into the casing, after microbial fermentation made of a stable Microbiological properties and typical fermented scented meat products [3]. Almost every country have their own fermented sausage, such as Germany has Dauerwurst sausage and so on [4]. Traditional fermented sausage flavor unique, nutrient-rich. There are still many shortcomings: the production cycle is long and so on. If you add beneficial microorganisms as a starter during the fermentation process, you can improve the product in all aspects of the

effect. Therefore, the starter has become the important role in fermented sausage.

Fermented sausage origin, development and classification

Fermented sausage has a long history. About 2,000 years ago, the Romans knew with meat and salt, sugar and spice by natural fermentation into a delicious sausage, and it has a longer storage period [5, 6]. According to the fermentation methods, it can be divided into two historical stages: the 20th century before the natural fermentation; the 20th century, Europe and the United States in order to manually add the fermentation agent as a symbol. Modern biotechnology and modern fermentation control technology for fermented sausage development and production [7]. Table 1, shows that There are many kinds of fermented sausages, and it is difficult to classify them from the three aspects of dehydration degree, fermentation acidity and origin [8].

Microorganisms commonly used in fermented sausages and their effects

Table 2, shows that Microorganisms in the environment are not only large, but also species. No matter what kind of microorganisms do starter, should meet the characteristics of meat fermentation starter cultures. Microbes and their effects in fermented sausages have been studied [9-29].

Table 1. The commonly Classified methods of fermented sausage

Basis	Name	Features	Examples
Degree of dehydration	Dry	Filtration rate > 30%	thick sausage
	Semi-dry	Filtration rate > 20%	katenrauchwurst
	Quit	Filtration rate < 10%	Teewurst
fermentation acidity	Low acidity	Ph ≥ 5.5	Salami sausage
	High acidity	Ph < 5.4	Summer sausage
Origin	German	Taste relative to teach acid	Dauerwurst
	American	High acid fermentation	Summer sausage
	Chinese	Natural dry, low water low acid	Harbin red sausage

Table 2. Fermented sausage commonly used micro-organisms and its role

Microbial type		Name	The role of the sausage
Bacteria	Lactobacillus	L.plantarum	Improve the organization of meat; promote hair color; accelerate drying; inhibit pathogen growth and toxin production
		L.casai	
		L.curvatus	
		L.sake	
	streptococcus	Str.acidilactici	Promote color and stability of color; delay rancidity; improve flavor
	pediococcus	P.acidilactici	
		P.pentosaceus	
	microoccus	M.varians	Delayed rancidity and redness
	staphylococcus	S.carnosus	
Yeast		Candida famata	
Mold		P.candidum	Forming a unique appearance, conducive to dry and so on

Research of fermented sausage starter cultures

Starter is contained can play an ideal metabolic activity in fermented substrate of live or dormant microbial agents, and can play in the sausage meat products such as ideal metabolic activity of microbial preparation meat starter cultures [30].

The functional research of starter cultures

Study on the fermentation starter cultures of good flavor meat. The flavor of fermented meat products is one of the important indexes of its quality decision. Flores, etc. [31] research shows that, Barry saccharomyces strains can restrain by inhibiting lipid oxidation and rancidity substances such as promoting good flavor sausage and so on researches.

Bacteriocin production ability of stduy. Bacteriocin can inhibit the growth of bacteria in the micro-molar concentration, so that organisms are naturally competitive bacteria Advantage. Sarika etc. [32] to study the plant lactobacillus MTCC B1746 and lactic acid milk coccus MTCC B440 production under the condition of calcium alginate embedding fixed bacteriocin ability; Hu Yimin [33] isolated from the traditional fermentation of bacon and sausage in the three strains of Listeria monocytogenes have a significant inhibitory effect of lactic acid bacteria and so on researches.

Reduce the production of biogenic amines. Domestic and foreign related research shows that excessive biological amine will cause harm to the human body [34,35]. Therefore, become the

focus of the researchers. Baka et al [36,37] found that inoculation of *Lactobacillus sake* can significantly inhibit the formation of biogenic amines in fermented sausages; Tan Ligong [38] study xylose such as *Staphylococcus*, *Lactobacillus casei* all can effectively reduce the specific content of biogenic amines in fermented sausage and so on researches so on researches.

Conclusions and future outlook

The domestic research on the fermentation of meat products started later. In recent years, the pace of development is relatively fast but most are still at the laboratory level, the application is very limited. How to produce more fermented sausages with longer shelf life, good quality, high safety and no traditional fermented sausage flavor, appearance and organization characteristics is a new challenge for the current meat fermentation industry. Fermentation starter culture, process improvement and other measures in the fermentation sausage safety, sensory and health quality has an important role in upgrading. The combination of different functional strains will better play the advantages of each strain, the study of different functional strains of synergistic or inhibitory properties to prepare multifunctional compound fermenters will become the focus of future research. With the technological progress of meat processing, the role of various microbes in fermented sausages is still in-depth research, in order to provide the basis for the selection of the best strains of production. We have the confidence and ability to China's fermentation of meat products to overseas.

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