Anwendung der technischen Starterkulturen für die Herstellund fermentierter Wurste

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In früheren Forschungen haben wir die positive Ergebnisse der anderen Autoren über die Anwendung der reinen Kulturen von den Milchsäurbakerien und Mikrokokken für die Herstellung der fermentierter Würste festgestellt.

Wegen der verschiedener Schwierigkeiten, welche die importierte Kulturen in der Anwendung mitbringen, haben wir versucht unsere Kulture vorzubereiten mit dem Ziel der billiger mikrobiologischer Prozedur für die Wurstherstellung beizutragen.

In unseren Versuchen haben wir zwei folgende Kulturkombinationen angewandt: Streptococcus lactis + Micrococcus M-104 und Lactobacillus casei + Micrococcus M-104.

Die angewandte Kulturen sind in folgenden Nährböden: die peptonisierte Fleischbouillon, das Magermilch und das pasterisierte Fleisch mit der Saccharose kultiviert. Mit diesen Kulturen, von 48 Stunder, haben wir die Würste von derselben Fleischmasse hergestellt. Die Würste ohne genarnre Kulturen dienten als Kontrolle in den Versuchen.

Die Ergebnisse haben gezeigt, dass die beste Wurstqualität ist von den Kulturen, die im pasterisierteem Fleische kultiviert waren, bekommen. Daneben ist die Vorbereitung dieser Kultur sehr ökonomisch, was auch für die Ökonomie der Wurstherstellung sehr wichtig ist.

The use of technical starter culture in the manufacture of fermented sausages

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In our prior investigations we have confirmed the positive results of others authors, concerning the application of lactic acid bacteria and micrococci pure cultures used for the production of fermented sausages.

Because of some difficulties, occuring during the application of imported cultures, we have decided to prepare our culture with the aim to find less expensive microbiological processes for the sausages production. In our experiments we used two culture combinations: Streptococcus lactis + Micrococcus M-104 and Lactobacillus casei + Micrococcus M-104.

The prepared cultures were cultivated in the media as follows: meat-peptone broth, skim milk and pasteurized ground meat with sucrose. With this 48 hours old cultures we elaborated sausages from the same initial raw meat; non inoculated sausages served as control in this experiments.

Our results shown the best sausages quality was obtained using the cultures cultivated in the pasteurized meat. It is to mention that the production of this technical cultures is very economical, what is also important for the economie of the sausage production.

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Utilisation des cultures de starter technique pour la production des saucisses fermentées

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Dans les recherches antérieures nous avons confirmé les résultats positifs des autres auteurs, concernant l'utilisation des cultures pures des bactéries acidolactiques et Micrococcus pour la production des saucisses fermentées.

Mais, à cause des difficultés différents qui se posent dans l'application des cultures importées, nous avons essayé de préparer notre culture avec le but de trouver une procédure microbiologique moins couteuse dans la production des saucisses.

Dans nos experiments nous avons utilisé deux combinaisons des cultures: Streptococcus lactis + Micrococcus M-104 et Lactobacillus casei + Micrococcus M-104.

Les cultures preparées étaient cultivée dans les milieux suivants: le bouillion peptonique, le lait écrémé et la viande pasteurisée avec le saccharose. Avec ces cultures de 48 heures nous avons élaboré des saucisses à partir de la même matiére premiére. Les saucisses sans culture se sont servi en témoin.

Les résultats ont montré que les meuilleures saucisses sont élaborées avec les cultures, cultivées dans la viande pasteurisée. En autre, la production de cetle culture est plus économique, ce qui est également important pour l'économie de la production des saucisses.

Использование рабочей закваски в изготовлении сырокопченых колбас

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В предварительных исследованиях мы потвердили данные из литературы, согласно которым применение чистых заквасок бактерий молочной кислоты и микрокок приводит к положительным результатам в производстве сырокопченых колбас. Учитывая многочисленные проблемы возникавшие при испльзовании импортных заквасок, мы попытались подготовить соответственные рабочие закваски в нашей лабаратории и тем самым найти более дешевый способ использования полезного действия микроорганизмов.

В экспериментах использованы две комбинации заквасок: Streptococcus lactis + Micrococcus M-104 and Lactobacillus casei + Micrococcus M-104.

Закваски подготовлены в мясопептоническом бульоне, снятом молоке и пастеризованном мясе с прибавлением сахарозы. С этими заквасками, с момента разведения которых прошло 48 часов, изготовлены колбасы причем во всех случаях использовано одинаковое сырье. Одновременно проведены исследования колбас без прибавочных заквасок, выполнявших роль контроля. Полученные результаты приводят к выводу, что колбасы изготовленые с заквасками разведенными в пастеризованном мясе, обладают наилучшим качеством. Кроме того, производство такой рабочей закваски является самым экономичным, что кроме остального, имеет значение для экономического эффекта производства колбас в целом.

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Introduction

Many authors proved that the application of pure and conjoint cultures of lactic acid bacteria and micrococci significantly contributes to the better quality of the fermented sausages (2, 3, 4, 6, 7, 8, 9, 11).

This bacteria are multiplied and produced in the concentrated or lyophilized form in which they can be easily used for the manufacture of sausages.

However, from the countries which have not own culture production, the application of the imported starter cultures represents sometimes serious problem. The imported starter cultures are relatively expensive and the activity of the bacteria can be reduced during the unfavorable transportation conditions.

Having in mind this situation it is evidently necessary that for the practical work is very important to produce less expensive own starter cultures. We have become this idea from the dairy factories, where the dried starter cultures are used, but as a laboratory cultures. From these laboratory cultures the technical starter for the production is prepared.

Following the same way we try to prepare the technical starter for the manufacturing of fermented sausages. In this aim we carried out some experiments and their results are shown.

Materials and methods

In this investigations work were used following pure cultures: Lactobacillus casei - 17 Š, Streptococcus lactis Ak-60 and Micrococcus M-104.

The fermented sausages as "Čajna" were prepared in three different variations: 1. with cultures multiplied in yeast dextrose broth (YDB, 5); 2. in skim milk and 3. the cultures were multiplied in pasteurized ground beef meat with 1% succrose. The cultures were 48 hours old and quantities used were 1% of the raw material for the sausages, white for the cultures in the ground beef meat were 2%.

During the manufacturing and ripening of fermented sausages: total bacterial count on the yeast dextrose agar, was conducted lactobacilli on the Rogosa agar (10); Barnes (1) medium was used for the streptococci, meat peptone agar with added 10% NaCl for the micrococci.

The samples for the microbiological analysis were taken from fresh meat and then 1., 3., 6., 12. and 21 days from the sausages manufacture. Simultaneously with the microbiological analysis conducted were also: pH value and loss of weight during the ripening of the sausages.

For the organoleptic evaluation the point system from 1 to 5 points was employed. Important factors in this evaluation were, appearance, consistency, cutting characters, taste and flavour of the sausages.

Results and discussion

The fermented "čajna" sausages with pure and conjoint cultures of Streptococcus lactis and Micrococcus M-104 in several experiments were manufactured. In all the experiments variant sausages with conjoint cultures of streptococci and micrococci had a better taste and aroma than the rest of the variants.

In these experiments, besides the starter cultures of Str. lactis and Micrococcus M-104, Lactobacillus casei in the combination with Micrococcus M-104 has been used. The fermented sausages were prepeared in 4 different variations as following: 1. Lb. casei + Micrococcus M-104; 2. Str. lactis + Micrococcus M-104; 3. Lb. casei + Str. lactis + Micrococcus M-104 and 4. control variant without the addition of microbial cultures.

The results of organoleptic evaluation in more number of the experiments show that the best quality of sausages have variant with all three cultures and than variant prepared with Lb. casei + Micrococcus or Str. lactis + Micrococcus. Between these variants there were not much differences in the appearance, consistency and cutting caracters of sausages, but there were more differences in the taste and aroma. This differences was especially marked between the variant with added cultures and control variant without cultures.

The application of starter cultures in the manufacture of fermented sausages, as a liophilized cultures or multiplied in the medium, is rather expensive. We want to find less expensive way for using starter cultures in manufacture of fermented sausages. According to our opinion, the pasteurized ground beef meat with 1% succrose must be a good medium for lactic acid bacteria and micrococci, and at the same time less expensive.

In the experiments with Lactobacillus casei and Micrococcus M-104 multiplied in: 1. yeast dextrose broth, 2. skim milk and 3. ground beef meat, the best results in the organoleptic quality of the sausages were obtained with cultures multiplied in ground beef meat.

The results of the bacteriological analysis show that there are no significant differences in the dynamics of the growth of microorganisms in all three variants of sausages during the ripening time.

In the repeated experiments of the fermented sausages manufacture were used combinations Str. lactis + Micrococcus M-104 multiplied in pasteurized ground beef meat only.

The results of the bacteriological analysis of this experiment show the same tendency in the dynamics of the growth of microorganisms as in other experiments, during the ripening time of sausages.

However, the results of pH - values show it as lowest in the sausages with added Str. lactis + Micrococcus. Thise variant of sausages had the best organoleptic quality compared to the other ones. The variant of sausages with Lb. casei + Micrococcus got average points 4.07, the variant with Str. lactis + Micrococcus 4.43 and the control variant without starter 2.87 points only.

These results evidently show that for the manufacture of fermented "čajna" sausages the conjoint cultures of lactis acid bacteria and micrococci cultivated in a pasteurized ground beef meat with sugar, can be used successfuly as a starter.

The application of these method for the starter preparation is less expensive, for it is not difficult to pasteurise the meat, which is the part of raw material for the sausages manufacturing. This it is necessary only to have laboratory cultures for the meat inoculation as a technical culture, what is possible to be done in the factory laboratories.

We want to say that this work is a preliminary report because the ripening process in the sausages have been followed by microbiological analysis and organoleptic evaluation without

a chemical or biochemical analysis in detales. These experiments are continued and the results will offer the possibility to improve the production of fermented sausages in our country.

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