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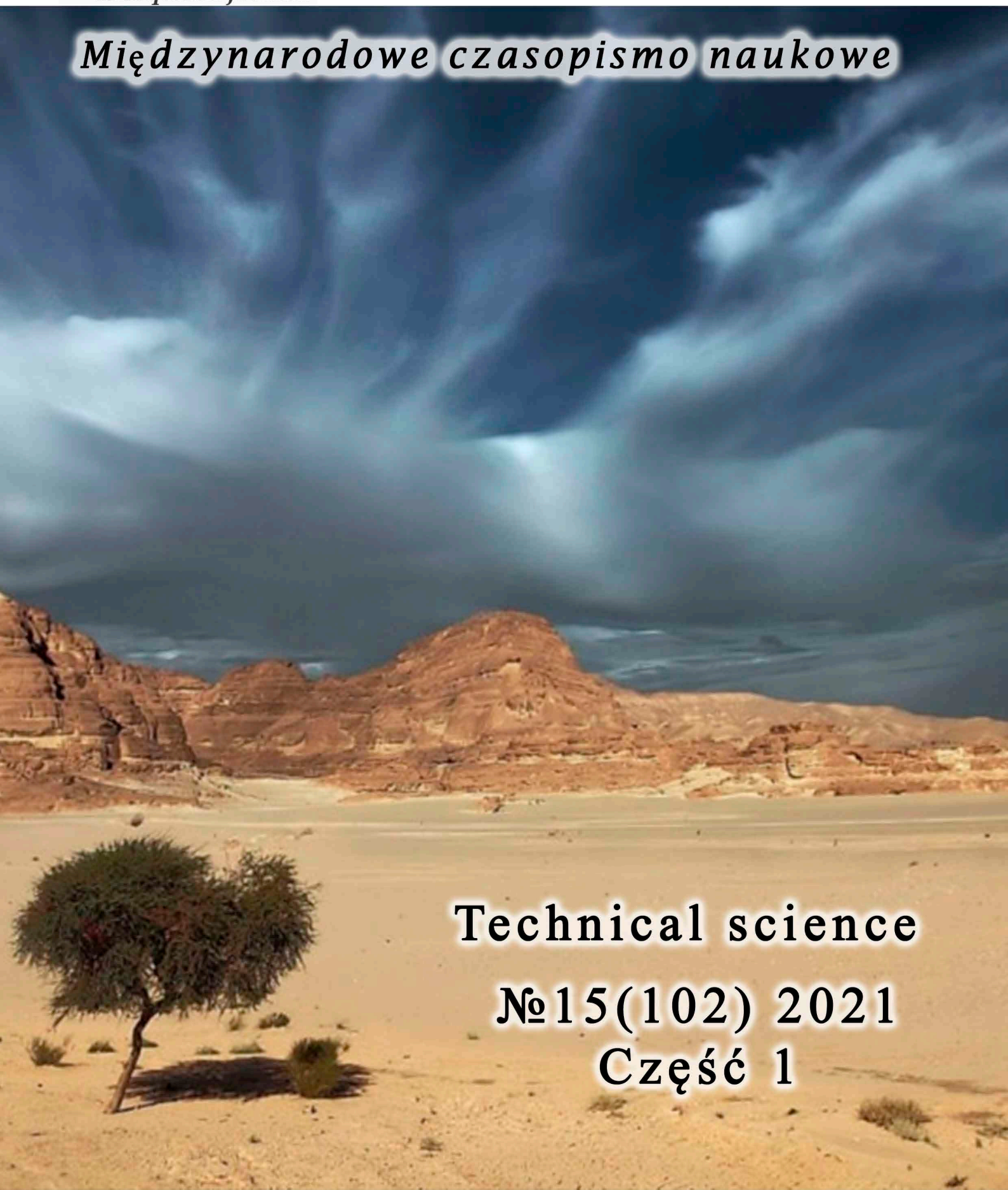

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CONTENTS

TECHNICAL SCIENCE

Основными характеристиками *ассоциативного правила* являются *поддержка* и *достоверность* правила.

Достоверность правила показывает, какова *вероятность* того, что из события А следует событие В.

Правило "Из А следует В" справедливо с *достоверностью* с, если с% *транзакций* из всего *множества*, содержащих набор элементов А, также содержат набор элементов В.

Число *транзакций*, содержащих молоко, равно четырем, число *транзакций*, содержащих печенье, равно трем, *достоверность* правила равна (3/4) *100%, т.е. 75%.

Достоверность правила "из покупки молока следует покупка печенья" равна 75%, т.е. 75% *транзакций*, содержащих *товар* А, также содержат *товар* В.

Границы поддержки и достоверности ассоциативного правила

При помощи использования алгоритмов поиска *ассоциативных правил аналитик* может получить все возможные правила вида "Из А следует В", с различными значениями *поддержки* и *достоверности*. Однако в большинстве случаев, количество правил необходимо ограничивать заранее установленными минимальными и максимальными значениями *поддержки* и *достоверности*.

Если *значение поддержки* правила слишком велико, то в результате работы алгоритма будут найдены правила очевидные и хорошо известные. Слишком низкое *значение поддержки* приведет к нахождению очень большого количества правил, которые, возможно, будут в большей части необоснованными, но не известными и не очевидными для аналитика. Таким образом, необходимо определить такой *интервал*, "золотую середину", который с одной стороны обеспечит нахождение неочевидных правил, а с другой - их обоснованность.

Если уровень *достоверности* слишком мал, то ценность правила вызывает серьезные сомнения. Например, правило с *достоверностью* в 3% только условно можно назвать правилом.

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DEVELOPMENT OF TECHNOLOGY FOR FERMENTED SOUR MILK DESSERTS ENRICHED WITH BIFIDOBACTERIA AND BIOLOGICALLY ACTIVE SUBSTANCES.

Abstract.

The work is devoted to the development of the technology of fermented fermented milk desserts enriched with bifidobacteria and biologically active and physiologically valuable substances of fruit and berry raw materials. Bifidobacteria regulate the qualitative and quantitative composition of the normal intestinal microflora, is an important factor in the body's defense against various intestinal infections. The health-improving effect is largely due to the biologically valuable properties of specially selected consortia of lacto- and bifidobacteria, which are more resistant to inhibitors and adverse environmental conditions.

With the combined use of selected consortia of strains of bifidobacteria and lactobacilli, in comparison with the use of individual strains of microorganisms, the number of viable cells of bifidobacteria increases by 3-4 times, antagonistic activity increases.

The use of fructose and lactulose as a biostimulating component of fermented milk desserts increases the activity, growth and development of bifidobacteria. To stabilize the structure of fermented milk clots, hydrocalides pectin and starch are used, it helps to increase the number of viable cells of bifidobacteria, provides the necessary viscosity and a certain moisture content, prevents stratification when using fruit and berry prebiotics. The optimal shelf life of fermented milk desserts at a temperature of (3 ± 1) ° C is no more than 15 days.

Keywords: *bifidobacteria, lactic acid bacteria, fruit and berry prebiotics, probiotics, synbiotics, fermented milk desserts.*

A person is constantly affected by a whole range of unfavorable factors, including the massive uncontrolled use of chemotherapeutic drugs that alter the normal functioning of the body's main vital systems.

In this regard, the question arose about how to restore the optimal intestinal microflora, which is characteristic of a healthy organism.

At the international level, there is a constant growth in the consumption of fermented milk products

both in Ukraine and abroad, the popularity of which is due to the pleasant taste and medicinal properties [1]. Particular attention is paid to bifidobacteria, which dominate the intestinal microflora of adults and children. In this regard, special attention is paid to the issue of maintaining microbial balance in the gastrointestinal tract, as a protective factor in human life [5]. The most effective way to normalize the imbalance of intestinal microbiocenosis is the use of synbiotics, that is, a complex of probiotics and prebiotics, and the manufacture of products based on them, which will stimulate the human intestinal microflora [5]. The problem associated with the development of technologies for the production of fermented fermented milk desserts for functional purposes based on synbiotics enriched with bifidobacteria and biologically active substances of plant origin is urgent.

The aim of the work is to develop a technology for fermented fermented milk desserts enriched with bifidobacteria and products of processing plant raw materials.

To create functional fermented products, it is necessary to determine the composition of highly efficient cultures of microorganisms, which, along with high productivity, have a high and varied biochemical activity [4]. The correct choice of biologically active strains of bifido- and lacto cultures for the production of fermented dairy products allows you to obtain a quality that meets the requirements of the normative documents of Ukraine DSTU 2212: 2003 change 2013 and international countries (Denmark) ISO 27205 / IDF 149 [3,4] in organoleptic and physical - chemical indicators.

One of the promising directions for creating functional fermented milk products is the development of complex starter cultures based on consortia of probiotic bacteria of various taxonomic groups, which are more resistant to unfavorable environmental factors and have a higher activity compared to starter cultures made using pure monocultures [8]. The selection criteria for strains of lacto- and bifidobacteria for fermenting compositions is their biological activity, that is, the ability to provide a predictable functional effect on the human body, as well as technological parameters that will make it possible to obtain dessert fermented milk products with certain physicochemical and rheological properties.

To create consortia, a screening of seven species of lactic acid bacteria was carried out, which were assessed by their ability to ferment lactose, the level of acid formation, and proteolytic activity. The authors of the article found that a high level of lactose consumption is observed in thermophilic cultures of the species Lactobacillus acidophilus and S. thermophilus. The lactobacillus L. Acidophilus has the highest proteolytic activity in terms of an increase in the amount of free amino acids and a high acid-forming ability. In addition, acidophilus sticks are capable of producing antibiotics acidophilus and lactocidin, the effect of which is enhanced in the presence of lactic acid.

The creation of consortia of individual strains of bifidobacteria can significantly improve the technological properties of microorganisms. The number of viable cells increases on average by 3-4 times, which indicates the absence of mutual suppression of the used strains of bifidobacteria in the consortium. With the combined use of selected consortia of strains of lacto- and bifidobacteria, the antagonistic activity of the used compositions of microorganisms increases. All investigated strains of lacto- and bifidobacteria are resistant to developmental inhibitors [9].

As stimulators of the growth and development of bifidobacteria, prebiotics are used - fructose and lactulose, which stimulate the growth and development of bifidobacteria in the composition of fermented milk products, accelerates the process of acid formation [2]. During the fermentation of sterilized skim milk by a consortium of bifidobacteria for 6 hours, the active acidity in the presence of fructose is pH 4.64, lactulose - pH 4.6, without stimulants - 4.7, while the titratable acidity reaches 68, respectively 72 and 52%. The lower active acidity and the significantly higher titratable acidity of the samples in the presence of bifidostimulants can be explained by the increased activity of bifidobacteria and the formation of acetic acid along with lactic acid during fermentation, which is a stronger electrolyte than lactic acid.

To prevent the structure inherent in dessert fermented milk products, hydrocolloids were used. Pectin activates the development of bifidobacteria during fermentation. The use of 0.3% pectin helps to increase the number of viable cells of bifidobacteria in dessert products from 1×10^4 CFU / cm^3 to $2,5 \times 10^8$ CFU / cm^3 compared to the control, in which the number of bifidobacteria increases to $1,2 \times 10^7$ CFU / cm^3. Starch allows to obtain a homogeneous jelly-like structure with a glossy surface, inherent in pastes and puddings [10]. The use of hydrocoloids allows you to obtain the necessary structure, provide a certain moisture content, prevent the stratification of bifidogenic fermented milk products when using fruit and berry prebiotics. The homogenization process is aimed at crushing casein micelles into submicelles, and milk fat - to balls with a diameter of less than 1.0 microns. Homogenization of the milk mixture according to the mode: pressure 15 MPa and t = 65 °C, promotes the formation and maintenance of a finely dispersed milk-fat emulsion, and the pasteurization mode (90 ± 2) °C τ = 2 min, ensures the necessary sterility of symbiotic products.

An important component of any product is taste fillers, which not only form organoleptic properties, but also enrich the products with biologically active ingredients - vitamins, minerals, polyphenols, and increase the body's resistance to adverse environmental conditions.

Semi-finished fruit juices without pulp were subjected to heat treatment at a temperature of 70 ... 80 °C for 20 minutes before being added to the fermented product. and cooled to a temperature of (37 ± 1) °C. When using juices with pulp, semi-finished juice products were wiped, homogenized at a pressure of P = (15-17) MPa, pasteurized at a temperature of 80-85 °C for 20 min., cooled to a temperature (37 ± 1) °C and was used as a fortifier in the manufacture of fermented dessert products.

Pectin was mixed in a separate container with dry fructose powder, dissolved in a small amount of skim milk, heated with constant stirring to a temperature of (90 ± 2) ° C, kept for 5 min., cooled to a temperature of (55 ± 2) ° C and sent into the mixing container.

The starch was poured with a fourfold amount of skim milk heated to a temperature of 30 °C, mixed thoroughly and left to swell for one hour. The resulting mixture with stirring was heated to a temperature of (85 ±

2) °C for complete dissolution of starch, cooled to a temperature of (55 ± 2) °C and sent to a mixing vessel.

The resulting mixture of normalized milk with bifidostimulants and stabilizers was stirred for 5 ... 10 minutes. and fed to the separator-purifier. The thoroughly mixed mixture was heated to a temperature of (65 ± 2) °C, homogenized at a pressure of P = (15 ± 2) MPa, and pasteurized at a temperature of (90 ± 2) °C with a holding time of 2 min.

The pasteurized mixture was cooled to a temperature of (37 ± 1) °C and fermented with a composition of adapted microorganisms, consisting of consortia of bifidobacteria (B. bifidum + B. longum + B. adolescentis) and lactobacilli (Lb. acidophilus + Str. thermophilus) in a ratio of 2: 1, in an amount of 5,0%, which contains 1×10^4 CFU / cm^3 of lacto- and bifidobacteria, was stirred for 20 ... 30 minutes with the gradual addition of a fruit and berry filler in the form of strawberry juice, packed in an airtight container, marked, squashed for (5,5 ± 0,5) hours to an active acidity (pH) of 4,6-4,7 and cooled to a temperature (3,0 ± 1) °C. The finished dessert fermented product was stored for 15 days at a temperature of (3,0 ± 1) °C.

It has been experimentally established that storage of fermented dessert products at a temperature of (3 ± 1) °C ensures the preservation of the developed desserts for 18 days without separating the whey. The probiotic properties of desserts remain at the level of 1×10^9 CFU / cm^3 for 20 days, but, starting from the 10th day, there is a gradual destruction of the structure with the release of individual drops of moisture. The optimal shelf life of dessert products was limited to 15 days.

Dessert fermented products were examined for organoleptic (table 1), physicochemical and microbiological indicators (table 2) immediately after manufacture and after 15 days of storage at (3,0 ± 1) ° C.

Table 1.

Organoleptic indicators of fermented dessert products

Indicators	*Dessert fermented products*	
	After packing	*After 15 days storage*
Relish and smell Pure,	fermented milk, liquor in the world, with aroma and scent alike	
Colour	From white-horny to horny, one-sided, equal by all weight	
Consistency and appearance	Homogeneous, tender, jelly-like mass, without fat sludge and serum separation, with a glossy surface	

Table 2.

Physicochemical and microbiological indicators of dessert products

Indicators	*Dessert fermented products*	
	After packing	*After 15 days storage*
Mass fraction of dry substances,%	25,25	25,25
Moisture content,%	74,75	74,75
Mass fraction of fat,%	2,5	2,5
Mass fraction of protein,%	5,56	5,56
Mass fraction of carbohydrates,% incl. dietary fiber	9,12 3,68	9,12 3,68
Active acidity (pH)	4,6	4,55
Titratable acidity, T	77	82
Viscosity, $\eta \cdot 10^3$ Pa · s	1,75±0,2	1,75±0,2
Mass fraction of polyphenolic substances, mg / 100 g	98	95
Mass fraction of vitamin C, mg / 100 g	5	2,2
Number of viable bifidobacterial cells, Lg CFU / cm3	9,8	9,6
Number of viable lactobacilli cells, Lg CFU / cm3	8,8	8,7
BGKP in 0,1 cm3	-	-
Energy value, cal / kJ	83/339	83/339

In terms of organoleptic, physicochemical and microbiological quality indicators, the obtained products meet the requirements set forth in the regulatory documents [2, 3] for dessert fermented products with an extended shelf life.

The biological value of the developed fermented fermented milk desserts is largely due to the properties of specially selected consortia of probiotic strains of lacto- and bifidobacteria and products of processing of plant raw materials.

The use of bifidobacteria in fermented milk products requires the selection of strains capable of developing in unfavorable conditions of production and the gastrointestinal tract.

Bifidostimulants fructose and lactulose increases the activity, growth and development of bifidobacteria, accelerates the process of acid formation.

The use of hydrocoloids makes it possible to obtain the required structure, provide a certain moisture content, and prevent stratification by bifidogenic fermented milk products when using fruit and berry fortifiers.

The developed dessert fermented products have a high nutritional and biological value, are characterized by a high content of bifidobacteria and lactobacilli, which allows them to be classified as functional products of a therapeutic and prophylactic orientation that can be stored for 15 days.

It is necessary to create new consortia of microorganisms, the composition of which will maximize the physiological, biochemical and technological potential of the microorganisms used, and improve the structural and mechanical properties. The formation of new consortia for individual strains of bifidobacteria will increase the number of viable cells of bifidobacteria and increase their antagonistic activity. When creating probiotic products, strains tested for symbioticity should be selected so that probiotic cultures complement each other in biological activity, showing a synergistic effect

in the product. It is necessary to enrich fermented milk products with products of processing plant raw materials, which will allow them to be enriched with insoluble polysaccharides, vitamins, phenolic and mineral substances, and to stimulate the development of bifidobacteria.

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МЕТОДИКА РАСЧЕТА ПАРАМЕТРОВ ТИРИСТОРНОЙ СУШКИ СТАТОРНОЙ ИЗОЛЯЦИИ

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THE PROCEDURE FOR CALCULATING THE PARAMETERS OF STATOR INSULATION THYRISTOR DRYING

Аннотация.
Приведена методика расчета необходимой силы тока для сушки статорной обмотки электродвигателя одно- и двухтиристорным устройством с должным коэффициентом мощности

Abstract.
A method for calculating the required current for drying the stator winding of an electric motor by a one- and two-thyristor device with an appropriate power factor is presented.

Ключевые слова*: сушка изоляции, тиристорное управление, статорная обмотка, гармонические составляющие*

Keywords: *insulation drying, thyristor control, stator winding, harmonic components*

При эксплуатации асинхронных электродвигателей нередко возникает необходимость подвергать их периодической сушке [1]. В условиях сельскохозяйственного производства в холодное время года наиболее интенсивно увлажняются электродвигатели, установленные в животноводческих помещениях. В последнее время для сушки электродвигателей применяют тиристорные устройства, выполненные на одном тиристоре [2] или на двух, включенных встречно-параллельно [3]. Ток нагрева

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