



UDC: 669.187

DOI: 10.31499/2616-5236.1(19).2022.259399

Blahopoluchna A. H.,

Pavlo Tychyna Uman State Pedagogical University; Lecturer-trainee of the Department of Technologies and Organization of Tourism and Hotel and Restaurant Business;

Liakhovska N.O.,

Uman National University of Horticulture., Lecturer of the Department of Biology

Neshchadym1 L. M.,

Ph. D. in Economics., Pavlo Tychyna Uman State Pedagogical University; Associate Professor of the Department of Technologies and Organization of Tourism and Hotel and Restaurant Business;

WASTEFUL TECHNOLOGIES MINI-PRODUCTION БЕЗВІДХОДНІ ТЕХНОЛОГІЇ МІНІ-ВИРОБНИЦТВ

Анотація. Міні-виробництва це сучасний тренд, який є економічно вигідним та менш затратним. Міні виробництво пива, молока, хлібобулочних виробів можна організувати як окреме виробництво або при закладі ресторанного господарства. В сучасних економіческих умовах зростає роль технологій, орієнтованих на використання або переробку сировини різного походження у закладах ресторанного господарства. Такий підхід обумовлений необхідністю вирішення проблем і підвищення економічних показників основного виробництва.

Такої тенденції ведення бізнесу дотримуються і підприємства ресторанного господарства в Україні. Велику популярність серед інвесторів, які вкладають фінанси в харчову індустрію, завоювала концепція створення виробничо-торгівельних комплексів ресторанного господарства.

Міні-пивоварні ресторанного формату - це ніша бізнесу, яка тільки зараз починає активно розвиватися в Україні. Найбільшою конкурентною перевагою міні-пивоварень перед великими пивзаводами є їхня здатність варити пиво ексклюзивного смаку і рецептур обмеженими партіями. Пиво власного виробництва додасть закладу ресторанного господарства свого

которити і дозволить виробляти смачний і якісний продукт, який буде викликати позитивні асоціації з їх брендом.

Переробка локальної сировини і виробництво на її основі крафтової продукції є перспективою для розвитку міні-підприємств харчової промисловості. Тому більшість виробників відходять від класичних технологій виробництва та створюють унікальну за смаковими характеристиками продукцію. Найбільш поширеними є виробництво крафтового пива, м'ясних виробів, сирів, настоянок, олій за принципами безвідходних технологій.

Abstract. *Mini-production is a modern trend that is cost-effective and less costly. Mini production of beer, milk, bakery products can be organized as a separate production or at a restaurant. In modern economic conditions, the role of technologies focused on the use or processing of raw materials of various origins in restaurants is growing. This approach is due to the need to solve problems and improve the economic performance of basic production.*

This trend of doing business is followed by restaurant companies in Ukraine. The concept of creating production and trade complexes of the restaurant industry has gained great popularity among investors who invest in the food industry.

Restaurant-format mini-breweries are a business niche that is only now beginning to develop actively in Ukraine. The biggest competitive advantage of mini-breweries over large breweries is their ability to brew beer of exclusive taste and recipes in limited batches. Home-brewed beer will add color to the restaurant and will produce a delicious and high-quality product that will evoke positive associations with their brand.

Processing of local raw materials and production of craft products based on it is a prospect for the development of mini-enterprises in the food industry. Therefore, most manufacturers move away from classic production technologies and create unique products in terms of taste. The most common are the production of craft beer, meat products, cheeses, tinctures, oils on the principles of waste-free technology.

Key words: *mini-productions, waste-free technologies, mini-bakeries, mini-breweries*

міні-виробництва, безвідходні технології, міні-молокозаводи, міні-пивоварні.

Introduction.

Complex restaurant enterprises are a combination of different types of enterprises that have a single set of production and storage and administrative premises. The construction of complexes allows in addition to savings and more efficient use of ancillary facilities to improve

and mechanize the production process and customer service.

Such enterprises organize on the principle of production of own production from raw materials and its realization as a part of the same food complex. The structure of such enterprises includes procurement shops for the production of various types of products, a wide range, but in limited

quantities. Each such shop is a mini-food production. This structure of production may include: confectionery shop, culinary shop, meat shop, beer shop, beer bar, milk processing shop, milk bar, restaurant, hotel, entertainment complex, etc.

On the basis of such an enterprise it is possible to implement the technology of complex processing of beer, dairy and bakery raw materials.

Formulation of research.

The purpose of the article is to study the use of waste-free technologies in the organization of mini-productions

Analysis of resent research and publications.

As for brewing, in the countries-manufacturers of equipment and where they are most widely used, mini-breweries and micro-breweries are called complexes of different capacity - from 300 to 6000 l / day and more. In some countries, all small-scale production (up to 10,000 liters / day) is a mini-brewery. For example, in Germany it is customary to classify small productions by functional purpose and divide them into two groups:

- home breweries (or amateur mini-breweries) and micro breweries with a capacity of up to 100-200 l / day, which mainly produce beer for their own needs, not for sale;
- restaurant or "bar" mini-breweries and production mini-breweries with a capacity of 300 to 2000 and 2000 to 4000 l / day, respectively, that produce and sell beer. The difference between them is that the former produce and sell beer, and the latter only produce it.

In the United States, there are only "neighborhood breweries" with a capacity of more than 6,000 liters / day,

they provide and meet the need for this drink in a small area of the city or town, and all other means of production (500 to 6,000 liters / day) as mini-breweries [1].

A somewhat different approach, somewhat similar to that adopted in Germany, is observed in the Czech Republic. Mini-productions with a capacity of 50 to 500 l / day are called micro-breweries, and more than 500 l / day - mini-breweries.

The most important thing is to ensure a balanced diet of products based on raw milk, as such products are common and everyday. Dairy products, due to their composition, are characterized by high nutritional value, easy to digest, also characterized by the ability to design the right indicators (amino acid, carbohydrate and fat) composition, taking into account modern principles of nutrition physiology.

Despite the successes, advances in food production technology, and also in the field of quality assurance, the problem of dairy processing has not been solved yet serum and some of these raw materials are consumed irrationally [2]. Complex restaurant enterprises are a combination of different types of enterprises that have a single set of production and warehousing and administrative premises. Construction of complexes allows in addition to savings and more rational use of ancillary facilities to improve and mechanize production process and customer service. Such enterprises are organized on the principle of production of their own products from raw materials and its sale as part of the same food complex [3].

Presentations of the main results.

The potential for increasing the number of mini-breweries in the restaurant format is significant - in the capital, in large industrial cities, but it also depends on the intentions and capabilities of potential consumers. As for resort towns, they are interesting to invest in, but sales will fluctuate greatly. The development of a franchise network of restaurant-type mini-breweries is relevant.

Mini-breweries usually produce beer with a limited shelf life. As for the recipes, they are mostly provided by the equipment supplier, but any recipes are adjusted directly at each individual production. Different beers are brewed sequentially. Most mini-breweries brew 3 ... 4 beers, because the number of beers depends on the productivity of the equipment - the number of fermentation tanks, free containers for storing beer - the more of them, the more you can brew varieties. After cooking, the equipment must be washed, but this need depends on the gaps between the cooking.

In restaurants with breweries, it is necessary to have a normal water supply (drinking water), sewerage, electricity supplied at 380 V.

Breweries of restaurant format are usually located on two levels - on the upper brewery, so that it can be seen by guests, and on the lower (basement) - the rest of the equipment, including fermentation tanks. An ordinary brewery is mostly located on the same level [4].

As the brewery is still a production, all sanitary norms on noise, emissions, distances to residential buildings, etc. must be preserved, although it is difficult to adapt to the conditions of

restaurants. If the equipment is brought from abroad, it should first be cleared through customs, then certified (if not certified), prepare a project proposal for the reconstruction of existing premises. The mini-brewery of the restaurant format does not need a large number of employees - mainly because the restaurant staff sells beer - waiters and bartenders (there are also kitchen staff, which is no less important for this format than brewers). To ensure the operation of a restaurant-type mini-brewery with a daily capacity of 500 liters, two people are enough: the main brewer and his assistant [4].

In recent years, there has also been a tendency to organize the production of dairy products in specialized modules and low-capacity plants, directly on farms and personal farms. Typically, a mini dairy plant can process and pour from 100 liters to 20 tons of milk to produce dairy products, cheese, etc. Mini-plants are equipped with everything necessary for the full cycle of milk processing, namely, raw material reception, cooling, pasteurization, fermentation, milk powder recovery, storage of finished products, bottling and packaging of finished products. In addition, low volumes of milk processing imply the absence or insignificant transport costs, a more flexible system of assortment changes, maximum use of secondary raw milk and production waste with minimal labor costs per unit of output. However, dairy products produced by mini-factories must be manufactured in compliance with all requirements of applicable regulations.

It is important that improving the efficiency of milk processing in the agro-industrial complex is directly

related to the full and rational use of all components of raw milk on the principles of waste-free technology, because processing processes are associated with the formation of dairy protein-carbohydrate raw materials - skim milk, butter and milk serum. Thus, in the production of 1 ton of

butter you can get up to 20 tons of skim milk and 1.5 tons of buttermilk [5]. The scheme of traditional technological directions of processing of raw milk in the conditions of mini-productions is presented in figure 1. Secondary raw materials in this case are whey which is received at manufacture of sour-milk cheese and, as a rule, goes on a forage

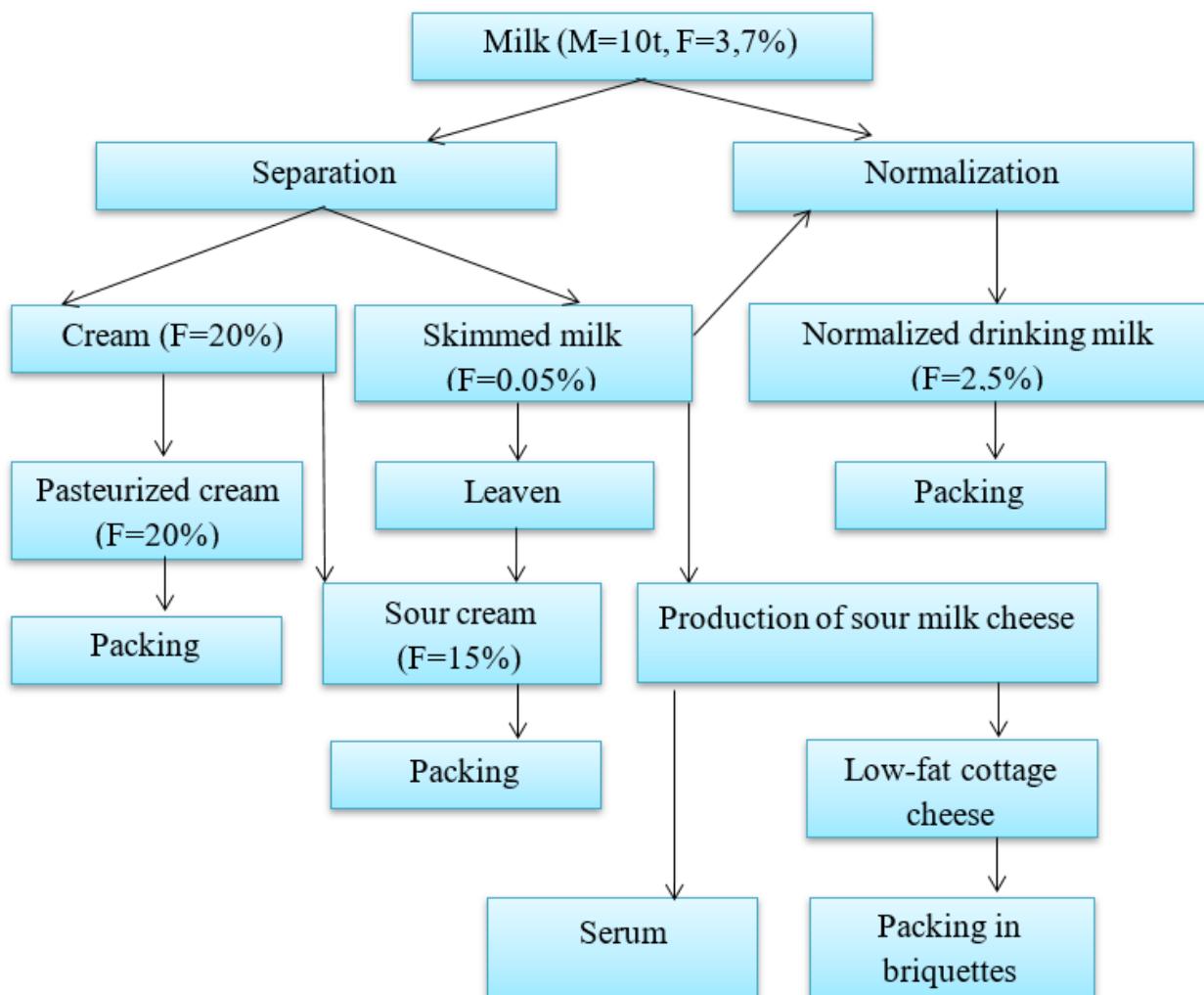


Fig. 1 - The scheme of traditional technological directions of processing of dairy raw materials in the conditions of mini-productions

For rational processing of raw milk in the conditions of mini-productions according to the principles of waste-free technologies it is expedient to return whey to products and, using the electrodialysis unit, to enrich them with

valuable components, namely, whey proteins.

Today in the mini-shops of agricultural production and farms widespread simplified technology for producing sunflower oil, based on simple and inexpensive equipment. To obtain

high-quality edible oils, they must be cleaned as much as possible from related substances, ie mechanical impurities, phosphatides, waxes, soaps and hydrophobic fractions. This process can be implemented according to the technology developed by us on the basis of physical methods using special centrifugal devices, ceramic microfilters, hydrating means for cleaning phosphatide concentrate, followed by belting-filtration of monobasic unsaturated acids.

The complex of technical means provides pressing of oil seeds, clearing of mechanical impurity by centrifugation, removal of water under vacuum, super purification (clarification), coagulation and hydration of oil. Designed to produce environmentally friendly sunflower seed oil.

The technological process is performed in the following sequence. Oil seeds are to be pressed, then the crude oil is fed to a centrifuge for cleaning from mechanical impurities. The purified oil enters a vacuum chamber to remove water and low-boiling fractions, then is fed to the super-cleaning unit for microfiltration and clarification. In the technological process, if necessary, an ultrasonic cavitator is used to reduce the acidity of the oil.

To implement the technology of obtaining vegetable oil, a set of technical means is proposed, which contains:

1. Pressing unit (serial production).
2. Block of coagulation and hydration.
3. Centrifugation unit.
4. Vacuum drying unit.

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5. The block of superpurification (microfiltration).
6. Pressing unit (serial production).
7. Block of coagulation and hydration.
8. Centrifugation unit.
9. Vacuum drying unit.
10. Super-cleaning unit (microfiltration).

The complex formed on this principle provides reception of ecologically pure vegetable oil on waste-free technology and in the conditions of farms. The effectiveness of the method of obtaining clarified environmentally friendly vegetable oil while fully preserving the organoleptic quality and nutritional value of the product. This effect is achieved by using in the production of oil only physical and mechanical processes, without chemical treatment. The technology is implemented by a compact small technical complex, made of modular-block type, which is easy to manage [6].

Conclusion.

It is established that mini-productions are economically advantageous from the point of view of introduction of waste-free technologies on them. In mini-dairies it is advisable to use recycled whey and other components for feed or vitamin and mineral supplements for animals. It has been studied that mini-breweries located directly in restaurants can use water more efficiently using several levels of purification and purification. It is expedient to introduce technologies of reprocessing of meal into granulated food additives and bird feed on mini-oilseeds.

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How to Cite:

Blahopoluchna , A. H., Liakhovska , N., & Neshchadym , L. M. WASTEFUL TECHNOLOGIES MINI-PRODUCTION. *Economies' Horizons*, (1(19), 32–38.
[https://doi.org/10.31499/2616-5236.1\(19\).2022.259399](https://doi.org/10.31499/2616-5236.1(19).2022.259399)