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*Harmider L. D.^a, Honchar L. A.^a, Serhieieva O. R.^b, Vinichenko M. M.^a***ASSORTMENT MATRIX AS A BASIS FOR ASSORTMENT PLANNING**^a **Ukrainian State University of Chemical Technology, Dnipro, Ukraine**^b **Alfred Nobel University, Dnipro, Ukraine**

The article highlighted the significance of the assortment matrix for a retail enterprise as a basis for assortment planning. That is why the issues of planning and optimizing the range of products do not lose their relevance in modern business conditions. One of the most important tasks in assortment planning is the definition of promising assortment positions for the company. To build the assortment matrix, the results of previous research on the structuring of the assortment based on the results of a combined analysis using the ABC and XYZ methods were used, which made it possible to determine the most demanded product positions and the lack of stability of the assortment at the research enterprise. The formation of the assortment matrix was carried out on the basis of the approved retail trade classifier and the analysis of sales for the period of six months. Taking into account the fact that the capabilities for storing fish products are always limited and require significant expenses, this group was chosen to determine whether the volume of the offered assortment meets consumer demand. The largest share among fish products was taken by canned fish, which is why the assortment matrix was compiled for this product group. The basis of the assortment was formed by canned fish snacks, with the volume of cans from 150 to 200 grams and more. The analysis of the assortment of canned fish was carried out according to their share in the profit for the first half of 2021, due to the volume of packaging, and, in addition, the number of product items was also determined. Next, the segments were combined by types of canned goods and by volume of packaging. To form an assortment matrix, price segmentation was carried out, distinguishing the economy, mass and premium segments, which determined the number of product positions of each type of canned food in different price segments. The last step was to conduct a study of each trademark of various types of canned food, where the analysis of sales by profit share was used, an ABC analysis was performed, and the number of product positions per trademark was determined. The assortment matrix, built in the end, showed that 48 items of canned fish are not in demand by consumers, and therefore should be excluded from the assortment.

Keywords: assortment analysis, product position, retail trade enterprise classifier, assortment matrix.

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Problem statement

The effectiveness of the functioning of retail enterprises depends significantly on the formation of the assortment of goods and its management, which involves the selection of such nomenclature

of goods that fully satisfies the needs of consumers and ensures high profitability of work. In connection with the significant expansion of the assortment and its deepening, where the number of assortment items in supermarkets and hypermarkets reaches more than

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25 thousand items and more, assortment management requires the improvement of existing approaches and the compilation of an assortment matrix.

Analysis and research of publications

Issues of assortment management were covered in the works of P. S. Abarkin, S. R. Krasilnikov, B. G. Zhirov, Ye. A. Buzukova, C. V. Sysoeva, M. G. Gleeva, O. V. Zozulyova, etc. [1-6].

Despite the considerable number of works in this direction, the problem of assortment management remains unsolved and quite relevant.

The purpose of the article

The purpose of the study is to develop an assortment matrix for retail trade enterprises that offer food products for everyday consumption.

Statement of the main material

There are different directions in the formation of the assortment, depending on the purpose and strategic approaches of retail enterprises, which determines their assortment policy. Some companies base their assortment policy on narrowing the width and reducing the depth of the assortment, while others rely on its maximum expansion and deepening, although profitability is achieved in both first and second cases. However, the main goal of retail trade enterprises regarding the formation of the assortment is to ensure the optimal assortment of goods, which would create the best conditions for satisfying the demand of consumers and buyers and ensure the profitability of the whole production process.

The main factor affecting the competitiveness of a retail trade enterprise should include the formation of an assortment, which is a complex and constant process, where the final result of this work

is the compilation of an assortment matrix.

The assortment matrix is a complete list of all product items approved for a specific retail enterprise during a specific period of time, taking into account the requirements of the assortment policy, its features and location.

If earlier assortment lists were compiled, taking into account the type of store, the size of the retail space and the location, which allowed to control the availability of goods on sale, now the main purpose of creating an assortment matrix is assortment planning. It is the commodity matrix of retail enterprises that will allow to form an assortment taking into account costs and profitability for each product category, which will contribute to the reduction of product stocks and losses during the period of fluctuations in consumer demand and the increase of profit during seasonal sales.

A group of fish products was chosen to compile the assortment matrix, considering that the products of this group are perishable, yet very useful and in high demand due to their consumption properties.

To form the assortment matrix for fish products, all product groups of the approved classifier of the retail trade enterprise were used, since each product group has different consumer properties and different classification features (Table 1).

Before its compilation, it is necessary to determine the number of product items and conduct a sales analysis for at least six months.

Thus, let us consider the composition of the assortment matrix using the example of the canned fish group, which in terms of sales and profit occupies the largest share among fish products. To do this,

Table 1

Product list (classifier) of fish products for the supermarket

Denomination	Product group	Product category	
Fish products	Frozen fish	Frozen fish	
	Smoked fish products		Smoked fish v\p
			Sliced smoked fish
			Smoked fish w\p
	Chilled fish	Chilled fish	
	Salted fish products		Salted fish v\p
			Sliced salted fish
			Salted fish w\p
	Fish preserves	Fish preserves	
	Fish semi-finished products	Fish semi-finished products	
	Dried fish products		Dried fish v\p
			Dried fish w\p
	Live fish	Live fish	
Canned fish	Canned fish		

Note: w\p – without packaging; v\p – vacuum packaging.

we will divide the product group of canned fish into segments, according to classification features and properties that are significant for the consumer.

In the greatest demand among consumers are canned fish snacks, which are presented in a wide assortment and the price of which is considered, according to consumers, to be rather moderate.

Depending on the nature of preprocessing of fish, food and flavor additives, the group of canned fish can be divided into the following types or segments:

- canned fish in tomato sauce;
- canned fish in oil;
- canned fish in marinade;
- pates, pastes, minced fish;
- fish and plant-based preserves.

Depending on the volume of the can, what the consumer pays attention to, will also be divided into segments:

- up to 150 g;
- 151-200 g;
- 200 g and more.

Next, the number of product items in the middle of each type of canned fish should be determined, depending on the nature of the preprocessing of the fish, food and flavor additives. To do this, we will use the results of the analysis of sales of canned fish, taking into account the size of the profit and its share for the period of six months.

According to preliminary calculations, the total profit on canned fish equals UAH 181.613, where the share of each segment in the total profit by subgroup is shown in the Table. 2.

Table 2

Analysis of the assortment of canned fish by their share in profit

Type of canned fish	Profit made by each group in the 1 st half of the year	Profit share, %
Canned fish in oil	102539	56.4
Canned fish in tomato sauce	37969	20.9
Canned fish in marinade	16043	8.7
Pates, pastes, minced fish	14520	8.2
Fish and plant-based preserves	10542	5.8
Total amount	181613	100

Since the total number of product items of canned fish was 140 units, let us analyze its assortment by packaging volume (Table 3).

Next, the predicted share of profit for each product item will be calculated, where the total profit

Table 3

Analysis of the assortment of canned fish by packaging volume

Packaging volume	Number of commodity positions	Share by volume of packaging, %
Up to 150 g	10	7.2
151-200 g	51	36.4
200 g and more	79	56.4
Total amount	140	100

from the group is 100%, and the number of planned SKU for the product class is 92.

$$SKU = \frac{100\%}{92} = 1.09\%.$$

Thus, for every 1.09% in profit, 1 commodity position will be allocated on the shelf for each of the subgroups within the segment.

Before the distribution of product positions by segments, it is necessary to highlight the subgroups that gained a percentage of less than 1.09% and the leader subgroups.

We will take a closer look at their advantages and disadvantages.

If items with profit of less than 1.09% are removed from the assortment, this will lead to a loss of profit from their sale, unless there are no substitute goods. However, an increase in commodity items will negatively affect turnover. Therefore, it is not worth removing such product from sale, given that a potential consumer will not find it and will not satisfy their need.

The commodity positions of canned fish will be distributed depending on their type and taking into account their share in the profit (Table 4).

Table 4

Distribution of commodity items of canned fish depending on their type and their share in profit

Type of canned fish	Profit share, %	Number of commodity items
Canned fish in oil	56.5	52
Canned fish in tomato sauce	20.9	20
Canned fish in marinade	8.8	8
Pates, pastes, minced fish	8	7
Fish and plant-based preserves	5.8	5
Total amount	100	92

The commodity positions of canned fish will be divided depending on the volume of packaging

and taking into account their share in the profit (Table 5).

Table 5
Distribution of canned fish products depending on the volume of packaging and their share in profit

Packaging volume	Share by type of packaging, %	Number of commodity items
Up to 150 g	7.2	7
151-200 g	36.4	33
200 g and more	56.4	52
Total amount	100	92

To compile the assortment matrix, it is necessary to combine the segment by type of canned goods and the segment by packaging volume (Table 6).

A common method of dividing goods by price range is price segmentation, where 3 main segments are commonly distinguished: economy, mid-price and premium. If the manufacturer does not disclose

its price segment, producing products under different trademarks, then it is possible to determine the minimum one by ranking product items by cost. Thus, the minimum, average and maximum price will be determined, which will highlight three price segments - economy, mid-price and premium.

Table 6
Assortment matrix by types of canned food and packaging volume

Type of canned fish	Packaging volume, g		
	150	151-200	200
Canned fish in oil	6	20	26
Canned fish in tomato sauce		2	18
Canned fish in marinade	1	6	1
Pates, pastes, minced fish	–	5	2
Fish and plant-based preserves	–	–	5

According to the data of the sales analysis, the profit shares of the price segments were determined.

Table 7

Distribution of product positions by price segments

Type of canned fish	Price segments	Share by segments	Number of commodity items
Canned fish in oil	premium	3.4	3
	mid-price	15	14
	economy	30.7	27
Canned fish in tomato sauce	premium	4.8	4
	mid-price	8.3	8
	economy	8.9	8
Canned fish in marinade	premium	2.7	2
	mid-price	2.0	2
	economy	5.5	5
Pates, pastes, minced fish	premium	0.7	1
	mid-price	5.5	5
	economy	8.2	8
Fish and plant-based preserves	premium	0	0
	mid-price	2.1	2
	economy	3.5	3

Table 8

Assortment matrix of canned fish for a supermarket depending on types, volume and price segment

Type of canned fish	Packaging volume, g								
	Up to 150			151-200 g			200 and more		
	Premium	Mid-price	Economy	Premium	Mid-price	Economy	Premium	Mid-price	Economy
Canned fish in oil	–	–	6	2	10	8	3	15	8
Canned fish in tomato sauce	–	–	–	2	–	–	3	13	2
Canned fish in marinade	–	–	1	3	3	–	–	–	–
Pates, pastes, minced fish	–	–	–	–	–	6	–	–	2
Fish and plant-based preserves	–	–	–	–	–	–	–	–	5

Assortment matrix as a basis for assortment planning

Table 9

Selection by trademarks of canned fish

Brand name	Share in total profit	Profit share based on cumulative total, %	ABC analysis group	Number of commodity items by TM
"Brivais Vilnis"	21.5	21.5	A	28
"Aquamarine"	13.8	35.3		18
"Equator"	10.8	46.1		14
"Prolyv"	9.2	55.3		12
"More"	8.5	63.8	B	3
"Best Time"	6.9	70.7		2
"Morski"	5.4	76.1		2
"Akvamir"	4.6	80.7		1
"Vyhoda"	3.8	84.5	C	2
"Ryzhske zoloto"	3.1	87.6		2
"Kapitan smakiv"	3.1	90.7		3
"Morska kolektsiia"	3.1	93.8		2
"Rybne menui"	2.3	96.1		2
"Fish Line"	2.3	98.4		1
"Lybava"	0.8	99.2		0
"Favorite"	0.8	100		0

In this way, in terms of percentage, the premium segment is 11.76%, the mid-price is 33.76%, and the economy segment is 54.47%. As a result, the following distribution of product positions by price segments is outlined: 10 positions are in the premium segment, 31 positions are in the middle price segment, and 51 positions are in the economy segment (Table 7).

Thus, after determining the number of product items for each price segment, the assortment matrix was formed (Table 8).

To form the assortment matrix, it is necessary to decide on the trademarks (TM), using the sales analysis and calculate the share in the total profit of each of the trademarks (Table 9).

When selecting trademarks, the following criteria was taken into account: only well-known trademarks were included in the assortment matrix, little-known trademarks were introduced only in the case of the uniqueness of canned fish, and the number of trademarks was reduced if necessary.

After analyzing each trademark, using ABC analysis and the assortment matrix, the following results were obtained: trademarks "Brivais Vilnis", "Equator", "Aquamarine", "Prolyv" are the four leaders, which bring 55.3% of profit and which must necessarily be present in the matrix. Trademarks "Kapitan smakiv" and "Fish Line" have a unique range of positions ("Pink salmon in tomato sauce", "Trout in marinade", "Sockeye in marinade", "Tuna in marinade"), which bring significant profit.

In accordance with the research conducted, the assortment matrix according was filled in according to the trademarks, using the analysis of sales in their segments (Table 10).

The basis for building an assortment matrix was the maximum satisfaction of potential consumers based on data on consumer preferences and gross profit, which will guarantee receiving some significant

Table 10

Assortment matrix for a supermarket taking trademarks into account

Brand name	Price segments, units		
	Premium	Mid-price	Economy
"Brivais Vilnis"	4	8	16
"Aquamarine"	2	5	11
"Equator"	2	11	1
"Prolyv"	2	5	4
"More"	1	2	–
"Best Time"	1	1	–
"Morski"	1	1	–
"Akvamir"	–	1	–
"Vyhoda"	2	–	–
"Ryzhske zoloto"	2	–	–
"Kapitan smakiv"	3	–	–
"Morska kolektsiia"	2	–	–
"Rybne menui"	2	–	–
"Fish Line"	1	–	–

results in the long term.

Conclusions

Thus, the constructed assortment matrix will enable to construct a planogram and currently shows that, out of 140 product items, 92 remained, i.e., 48 items of canned fish must be excluded from the assortment portfolio, since, according to the conducted research, they are not in demand among consumers.

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АСОРТИМЕНТНА МАТРИЦЯ ЯК ОСНОВА ПЛАНУВАННЯ АСОРТИМЕНТУ

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В статті було висвітлено значущість асортиментної матриці для підприємства роздрібної торгівлі, як основи для планування асортименту. Саме тому питання планування та оптимізації асортименту продукції не втрачають своєї актуальності в сучасних умовах господарювання. Одним із найбільш значущих завдань при плануванні асортименту є визначення перспективних для підприємства асортиментних позицій. Для побудови асортиментної матриці використовували результати попередніх досліджень щодо структурування асортименту за результатами поєданого аналізу за ABC і XYZ- методами, що дало можливість визначити найбільш затребувані товарні позиції та відсутність стабільності асортименту на дослідному підприємстві. Формування асортиментної матриці здійснювали на основі затвердженого класифікатора роздрібно торгівлі та аналізу продажів рибних консервів за півроку. Враховуючи, що можливості для зберігання рибних товарів завжди обмежені і потребують значних витрат, було обрано саме цю групу, для визначення відповідності обсягу запропонованого асортименту, попиту споживачів. Найбільшу частку серед рибних товарів зайняли рибні консерви, тому і склали асортиментну матрицю за цією товарною групою. Основа асортименту склали закусочні рибні консерви, об'ємом банки від 150 г, до 200 г і більше. Аналіз асортименту рибних консервів проводили за їх часткою у прибутку за 1 півріччя 2021 р., за об'ємом упаковки та визначили кількість товарних позицій. Далі об'єднали сегменти за видами консервів та за об'ємом упаковки. Для формування асортиментної матриці провели цінову сегментацію, виділивши економ, масовий і преміум сегмент, що визначило кількість товарних позицій кожного виду консервів за різними ціновими сегментами. Останнім кроком було здійснення дослідження кожної торговельної марки різних видів консервів, де використано було аналіз продажів за часткою у прибутку, виконано ABC-аналіз й визначено кількість товарних позицій за торговельною маркою. Побудована асортиментна матриця показала, що 48 найменувань рибних консервів не користуються попитом споживачів, і тому повинні бути виключені з асортименту.

Ключові слова: аналіз асортименту, товарна позиція, класифікатор підприємства роздрібно торгівлі, асортиментна матриця.

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ASSORTMENT MATRIX AS A BASIS FOR ASSORTMENT PLANNING

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