

Valentyna Borkovska

Associate Professor

Department of Accounting, Taxation and Electronic Business Technologies
State agrarian and Engineering University in Podilia

& Member

Public Organization "Institute of Socio-Economic and Regional Studies"

Accounting and Analysis of Meat Production

Key words: Accounting, analysis, costs, volume of activity, performance, profitability, forecasting, economic decline, meat production.

Problem statement. Livestock is one of the leading, historically traditional for Ukraine agricultural industries. Cattle farming, especially meat, has always played an important role in overcoming the food problem. However, the historical events of February 2014 significantly affected the economic situation in the country as a whole. Special losses were suffered by enterprises working on imported raw materials, the cost of which in the structure of production costs averages 80-90%. In the Khmelnytsky region, as in Ukraine in general, most meat processing companies work with intermediaries to purchase meat on the bones, in blocks, carcasses, and so on. This is due to a critical reduction in agricultural producers, including cattle, which has significantly reduced livestock procurement. In addition, in recent years, the cost of incoming imported raw materials, for example, at the meat processing plant LLC "Kamyanyts-Podilsky Poultry" has increased almost threefold. Due to the above, processing companies are increasing the need for operational accounting and cost analysis in order to effectively plan performance.

Analysis of recent researches and publications. The researched questions of the organization of the account and the analysis of expenses, volumes and results of activity in meat production are paid attention by national scientists: P.Y. Atamas, F.F. Butynets, S.F. Golov, V.M. Zuk, V.P. Zavgorodniy, T.M. Kovalchuk, V.B. Mossakovsky, L.V. Napadovska, M.F. Ogiychuk, M.S. Pushkar, P.T. Sabluk, I.B. Sadovska, N.M. Tkachenko, N.V. Tluchkevich, L.M. Chernelevsky, Yu.S. Tsal-Tsalko and others. For example, according to his monograph I.B. Sadovska, "to keep an eye on the pulse of the economic organism to ensure its development and prosperity is called modern management cost accounting. Back in the XVIII century the great French scientist-accountant Jacques Savary emphasized that accounting is a function of management "[5]. This statement becomes progressively relevant in the so-called "stable instability" and requires further research in this area.

Unsolved questions which are the part of the general problem. Today, scientists are known to study the relationship between operational cost accounting and rational forecasting of results activities, concluded the need improving accounting support in order to timely and effective process management production at the enterprise.

The purpose of the article. In connection with the above, the purpose of science article is to improve the organization of internal (management) accounting costs in terms of developing an analysis mechanism the relationship between costs, volumes and profit on the example of meat processing enterprises of Khmelnytsky region.

Basic material. Summarizing the approaches of national and foreign scientists to determine the nature and purpose of the analysis of "costs - volume - profit", we can say that this is a method of systematic research the relationship between costs, volume of activity and it results to determine: sales, that will provide reimbursement of expenses and receipt of the desired profit; the amount of profit for a certain amount of sales; the effect of changes in magnitude costs, volume and sales price for the company's profit; optimal cost structure. Cost-volume-profit analysis is carried out using the following methods, combined into two groups: mathematical methods and graphical methods.

Based on the use of this method is the classification of costs for variables and permanent. At the same time, the main factor in the cost of production of meat processing enterprises is the volume of sold products. Then the variable costs include costs that change depending on the change in sales. The fixed costs of the enterprise include costs, the amount of which does not depend on volume of production. At the same time, studying the theory and practice of accounting for the cost of food processing of livestock products, it is appropriate to argue about the presence of rather conditional variables and conditionally fixed costs of meat processing production.

Particularly relevant is the division of costs into conditionally variable and conditionally constant when using the marginal method of analysis the cost-volume-profit relationship for terms of the range, the essence of which is to determine the marginal revenue of the enterprise as the difference between income and variable costs production. From the analysis of the data developed by the author [1], the reporting document No. 5 of the administrative reporting of the meat-processing enterprise (tab. 1, 2) it is visible that on some assortment positions the indicator of marginal income has negative value. This means that the price of products is so low and unreasonable that it does not even cover technological costs. Taking into account the combination of sales of the reporting period, we propose to calculate the average marginal revenue by the next formula 1:

Table 1

REPORT № 5 "Report on the formation of the actual cost of sausages"
(fragment of management reporting of the meat processing enterprise)

№	Assortment	Quantity	Raw material	Production cost						Total	Per unit	Other expenses						
				Natural packing	Additional material	Additional material			Expenses of transportation			Other packing		Other items	Natural losses	Gas	Water	Electricity
						Others	Wood	Total										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
	Boiled sausages																	
1	Total	20987,83	312635,89	33180,6	27331,27	1164,9	861,31	62538,08	375173,97	17,88	11165,05	719,04	2479,5	589,76	1360,59	406,33	1166,09	
	Sausages, hot dogs																	
2	Total	5202,04	76813,02	2085,86	8789,23	288,74	213,49	11377,32	88190,34	16,95	2767,36	178,23	614,58	146,18	337,24	100,72	289,02	
	Semi-smoked sausages																	
3	Total	8948,09	175376,84	9184,9	12624,03	496,65	367,23	22672,81	198049,65	22,13	4760,19	306,56	1057,14	251,44	580,08	173,23	497,13	
	Cooked and smoked sausages																	
4	Total	9805,27	212685,48	12992,65	12797,02	544,23	402,39	26736,29	239421,77	24,42	5216,18	335,92	1158,38	275,53	635,65	189,83	544,78	
	By-product sausages																	
5	Total	2459,15	9327,9	1674,61	963,82	136,49	100,92	2875,84	12203,74	4,96	1308,21	84,25	290,53	69,1	159,41	47,61	136,63	
	Fried sausages																	
6	Total	14,75	385,84	2,89	27,21	0,82	0,61	31,53	417,37	28,30	7,85	0,51	1,74	0,41	0,96	0,29	0,82	
	Smoked																	
7	Total	2836,59	98899,59	2110,34	4573,27	157,44	116,4	6957,45	105857,04	37,32	1509,01	97,17	335,12	79,7	183,89	54,92	157,6	
	Blood sausages																	
8	Total	186,65	1293,20	117,49	4,99	10,36	7,66	140,50	1433,70	7,68	99,29	6,39	22,05	5,24	12,10	3,61	10,37	
	Total	50440,37	887417,76	61349,34	67110,84	2799,65	2070,00	133329,83	1020747,59	20,24	26833,15	1728,03	5959,03	1417,36	3269,89	976,60	2802,45	

Table 2

REPORT № 5 "Report on the formation of the actual cost of sausages"
(fragment of management reporting of the meat processing enterprise)

№	Assortment	Quantity	Other cost							Total cost	Income	Income results	Cost	Price	M/R	KS	Resalt
			Salary	Salary taxes	Amortization	Others	Production cost	Other cost	Per unit								
1	2	3	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
	Boiled sausages																
1	Total	20987,83	6024,36	2054,85	584,29	890,78	391449,55	27440,62	1,31	402614,61	375809,37	-26805,24	19,18	17,90	0,02	0,42	-1,28
	Sausages, hot dogs																
2	Total	5202,04	1493,21	509,31	144,82	220,78	92224,39	6801,44	1,31	94991,76	88638,02	-6353,74	18,26	17,03	0,08	0,10	-1,23
	Semi-smoked sausages																
3	Total	8948,09	2568,47	876,06	249,12	379,81	204988,68	11699,23	1,31	209748,86	189571,99	-20176,87	23,44	21,18	0,95	0,17	-2,26
	Cooked and smoked sausages																
4	Total	9805,27	2814,51	960,01	272,98	416,17	247025,54	12819,94	1,31	252241,73	218891,43	-33350,3	25,72	22,32	-2,10	0,19	-3,40
	By-product sausages																
5	Total	2459,15	705,88	240,76	68,46	104,37	14110,76	3215,24	1,31	15418,98	23484,92	8065,94	6,27	9,55	4,59	0,05	3,28
	Fried sausages																
6	Total	14,75	4,23	1,44	0,41	0,63	428,80	19,29	1,31	436,65	379,26	-57,39	29,60	25,71	-2,59	0,00	-3,89
	Smoked																
7	Total	2836,59	814,22	277,73	78,98	120,39	108056,75	3708,71	1,31	109565,76	102233,14	-7332,62	38,62	36,04	-1,28	0,05	-2,58
	Blood sausages																
8	Total	186,65	53,58	18,27	5,20	7,92	1578,44	244,04	1,31	1677,74	1915,10	237,36	8,99	10,26	2,58	0,02	1,27
	Total	50440,37	14478,46	4938,47	1404,22	2140,84	1059862,94	65948,50	1,31	1086696,09	1000923,23	-85772,86	21,54	19,84	-0,4	1	-1,70

$$AMR = (MR\ 1 * KS\ 1) + (MR\ 2 * KS\ 2) + \dots, (1)$$

AMR – average marginal revenue;

MR 1 – marginal revenue per unit 1;

KS 1 – combination of sales per unit 1;

MR 2 – marginal revenue per unit 2;

KS 2 – combination of sales per unit 2.

$$AMR = (0,02*0,42) + (0,08*0,10) + + (-0,95*0,17) + (-2,10*0,19) + (4,59*0,05) + + (-1,28*0,05) + (-0,01*0,02) = 0,2246.$$

Calculating the average marginal income, we can determine the break-even point (critical sales volume, which will cover costs) of sausage production in physical units by the formula 2:

$$BEP = PC / AMR, (2)$$

BEP – break-even point;

PC – permanent cost;

AMR– average marginal revenue.

$$BEP = 65948,50 / 0,2246 = 293626,44\text{ kg.}$$

Taking into account the combination of sales for the previous reporting period, we propose to calculate the required amount of production for each assortment group, which in general will cover the variable and fixed costs of this production.

Then the critical need for production in terms of the range of sausages will be approximately:

- smoked sausages: $293626,44*0,42 = 123323,10\text{ kg.}$
- sausages, hot dogs sausages: $293626,44*0,10 = 29362,64\text{ kg.}$
- half-smoked sausages $293626,44*0,17 = 49916,49\text{ kg.}$
- smoked and half-smoked sausages $293626,44*0,19 = 55789,02\text{ kg.}$
- offal sausages $293626,44*0,05 = 14681,32\text{ kg.}$
- sausages $293626,44*0,05 = 14681,32\text{ kg.}$
- blood fried sausages $293626,44*0,02 = 5872,53\text{ kg.}$

In this case, the cost calculations of the critical volume of sales are not required, because the natural calculation was performed for each assortment group (assortment groups for blood and fried sausages are combined due to the small volume of production), the selling price of which varies depending on type of product.

Table 3

Costing sheet
on the formation of the actual cost of boiled-smoked sausage
"Sofiyivska with cheese"

No	Name	Quantity, kg.	Price	Total sum
1	Actual volume of production	753,00		
2	Regulatory demand of raw materials	836,66		
3	Raw materials:			
4	Beef	125,70	25,88	3253,24
5	Pork	125,70	32,77	4119,19
6	Tallow	209,50	19,67	4120,86
7	Pork	209,50	33,51	7020,65
8	Other raw materials			
9	Granules	83,80	3,73	312,95
10	Cheese	83,30	22,65	1886,33
11	Used raw materials	838,00		20713,22
12	Difference	1,34		
13	Additional materials:			
14	Natural packing			
15	Twine	2,00	24,98	49,95
16	Covering	705,00	1,00	705,28
17	Clips	6862,00	0,02	154,40
18	БProtein	850,00	1,15	977,50
19	Total	9269,00		1887,12
20	Other additional materials:			
21	Solt	18,40	0,44	8,06
22	Spices 1	3,35	52,86	177,09
23	Spices 2	2,50	47,26	118,16
24	Spices 3	2,50	75,30	188,25
25	Phosphate	1,50	16,37	24,56
26	Spices 4	2,10	68,87	144,63
27	Total	30,43		660,75
28	Other materials			41,79
29	Wood			30,90
30	Additional materials total			2620,56
31	Production cost			23333,79
32	Production cost per unit			30,99
33	Other cost:			
34	Other packing			25,88
35	Other items			88,96
36	Natural losses			21,16
37	Gas			48,81
38	Water			14,58
39	Electricity			41,84
40	Salary			216,14
41	Salary taxes			73,72
42	Amortization			20,96
43	Other expenses			31,96
44	Production cost			23917,73
45	Expenses of transportation			400,58
46	Other expenses total			984,51
47	Other expenses per unit			1,31
48	Actual cost			24318,37
49	Actual cost per unit			32,30
50	Actual revenue			19411,29
51	Prize			25,78
52	Resalt per unit			-6,52

The determined break-even point in volume 293626.44 kg can be recommended only theoretically. In practice, according to the capacity of the researched enterprise, such quantity of production cannot be provided in full. The maximum volume of sausage production, according to the technical documentation, is up to 5 tons per day.

Taking into account such individual features of production, the unprofitable sales of sausages are not explained by the limited capacity of the enterprise or a large amount of fixed costs, but mainly provided with high technological cost compared to the selling price.

For example, analyzing the cost of boiled-smoked sausage "Sofiyivska with cheese" according to the actual production volume of 753 kg, fixing that the technological cost of the unit is 30.99 UAH. (tab. 3).

The actual cost plus other costs is 32.30 UAH. At the same time, the selling price, even without covering variable costs, is set at UAH 25.78. for 1 kg. In this case, the marginal revenue of the product will be negative, and the commercial price, which will provide a planned profit of 5%, must be at least 40.00 UAH. for 1 kg.

On the other hand, price increases do not always guarantee the availability of effective demand of the population (as opposed to high quality), which is now exacerbated by the global economic crisis.

In conclusion, it can be argued that the marginal cost analysis showed the inefficiency of production at the stage of analysis of technological costs compared to the possible selling price. In this regard, we consider it appropriate for accountants and analysts, technologists or managers of meat processing plants to use the marginal revenue indicator at the stage of planning the volume of activities.

Conclusions and directions of future researches. Given the advantages and disadvantages of the methods of analysis of the relationship between costs, volume of activity and profit, the most promising is the use of a group of mathematical methods (based on operational data of internal accounting of income and expenses), which include the method of equation and marginal method income.

Along with these advantages, it is necessary to note the complexity or, more precisely, the organizational and technological feature of food processing of livestock products, which will affect the accuracy of the calculations. Mainly, it consists in the formation of a significant cost of work in progress at the end of the reporting period, which significantly affects the cost of current production in terms of variable costs, the size of which is the basis for effective analysis of activity and profit.

Therefore, the prospect of further research on the relationship between costs and volume of activity will be searching for possible ways to improve the process of calculating the cost of meat products, taking into account the size of the input and final balances of work in progress.

References

1. Borkovska V.V. (2013). Management reports of meat processing enterprises - Institute of Accounting accounting, control and analysis in the context of globalization: an international collection. - Ternopil: Krok, 2013. - Issue. 1 - p. 51–52. [in Ukrainian];
2. Golov S.F. (2006). Management accounting: [textbook]; 3rd edition. - K .: Либра. - 704 p. [in Ukrainian];
3. Drahan O.I. (2011). The meat industry innovative strategies formation – Economics of Market Relations, 7. p. 158-162 [in Ukrainian];
4. Drury K. (2005) Management and production accounting: [textbook] - M .: UNITY-DANA. -1071 p. [in Russian];
5. Sadovska I.B. (2008) Organizational management of the administrative region in the agricultural enterprises: theory and practice:[monograph] - Lutsk: RVV LNTU- 351 p. [in Ukrainian].