

## COMPARATIV STUDY BETWEEN ABC METHOD AND THE TRADITIONAL METHOD OF CALCULATING THE PRODUCTION COST

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### Abstract

This article aims to highlight how to calculate production cost using the Activity- Based Costing method (ABC), but also the traditional calculation method, to determine their advantages and disadvantages. These two calculation methods aim to determine the final production cost, but the approaches differ from one methods to another. The study is based on scientific research procedures, such as observation methods, economic analysis, case study and descriptive methods. The cost prices for the wine will be calculated, following all the steps from the two cost calculation methods. The differences and similarities between these two cost calculation methods will be presented through a case study at Research- Development Station for viticulture and winemaking Iasi. The use of the Activity- Based Costing method ensures a more correct allocation of indirect costs, allowing a better analysis of the elements that generated the costs, on the other hand, the traditional method of calculation costs requires amore simplistic approach, as it is not possible to analyze all cost-generating elements.

**Key words:** the ABC method, the traditional method, production cost, calculation methods

High profitability is the main objective of any economic activities and this profitability is directly influenced by the low cost of production (Brezuleanu S., 2009),

From this perspective, an important role is played by the multilateral knowledge of the production cost and the appropriate choice of cost calculation methods according the specifics of the activity (Costuleanu C., 2019).

The cost calculation methodology represents a set of solutions that are the basis of all actions necessary of the efficiency of the effort made to obtain a product, and based on it can be established efficient and less efficient activities, as well as profitable and less profitable products (Budugan D. *et al*, 2007).

In this article we will perform and analysis on the calculation of the production cost using the method of calculation, Activity-Based Cost-ABC, compared to the traditional calculation method to highlight the advantages and disadvantages of each method (Cucui I., Man M., 2004).

### Activity- Based Costing-ABC

This method emphasizes the strong connection between products and activities, marks an intermediate category, called activities between work centers and products (Dubrulle L., 2002).

Activities are the ones the generate costs, while products are the ones that create the order for these activities. The fundamental principle underlying this method is that activities consume resources and products consume activities (Dumitru M., Calu D.A., 2008).

The stages of determining the various types of costs within the application of these methods are (Bătcă C. *et al*, 2018):

1. The primary allocation of expenses from financial accounting;
2. The secondary distribution of expenses from the auxiliary section, if necessary;
3. Application of the algorithm specific to the ABC method: identifying activities and related costs; the choice of cost drivers for each activity; the establishment of regrouping centers; absorption of indirect costs (Hornfren C. *et al*, 2006).
4. Calculation of production cost;
5. Absorption of general administration and sales expenses;
6. Calculation of full cost.

The originality of the activity-based method- the ABC method- is in the USA and the basic work is considered to be The Hidden Factory, authors Jeffrey G. Miller and Thomas E. Vollmann. They carried out an analysis on the sectors and common cost places and came to the conclusion that there

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must be a system through which to control the indirect costs (Caraiani C., Dumitrana M., 2008).

The final version of the method appeared in 1987, being created by the authors Kaplan, Cooper and Johnson, to which is added the point of view of the representatives of various consulting firms and industrial enterprises of that time hour (Ristea M., Dumitru C.G., 2005).

The ABC method of activity-based costing was perceived starting from the need to acquire information as close as possible to reality regarding costs.

The purpose of implementing the ABC method is to establish the production cost corresponding to the outputs of the production process.

#### **Traditional calculation method**

This method takes into account the linked between production cost and the places or products for which they were incurred and has the following stages (Ionașcu I. *et al*, 2006).

1. Collection of direct expenses by cost drivers and indirect expenses by sectors and departments;

2. Calculation of the total cost of auxiliary production and the distribution of expenses corresponding to this production;

3. Distribution of indirect production costs on the products resulting from the basic activity of the enterprise, using the method of supplementation, the classic forms;

4. Allocation of general administrative expenses on the product obtained, works and services using method of supplementation, the classic forms, variant of the single or global coefficient;

5. Distribution of sales expenses on the products.

Through this stage, sale expenses will be added at the cost of the product. If it is not possible to identify them on the product, it can be distributed proportionally to the weight or volume of the products. The full cost of production is obtained by adding the shares of general administration and sales expenses to the product cost;

6. Quantitative and value determination of production in progress (Mahoney S., 2009).

From a quantitative point of view, the evaluation of the production in progress is carried out the basis on the inventory at storage place.

From a value point of view, production in progress is set at the effective cost, the number of manufacturing phases completed and the processing stage in which it is will be taken into account ;

7. Establishing the effective cost per product unit, by relating the total effective production expenses to the amount of finished products obtained in the reference period.

## **MATERIAL AND METHOD**

The content of the article is based on the deductive research method, starting from theory to practice. Other scientific research methods will also be used, such as observation, economic analysis, case study and descriptive methods.

To reflect the particularities of these two calculation methods we collected financial and management data from Research - Development Station for viticulture and winemaking IASI.

The case study was carried out for the quantity of 1000 liters of wine, from the 2021 harvest and has as its objective the distribution of expenses related to obtaining this amount of wine by applying these two methods.

According to table no. 1, direct expenses are 3900 lei, and indirect expenses to 2650 lei. Based on these values, we calculated the distribution coefficient (k), according to the following formula

$$K = \frac{\text{Indirect expenses to be apportioned}}{\text{Direct expenses}} = \frac{2650}{3900} = 0.67$$

Applying the apportionment coefficient to the value of direct expenses, we obtain the indirect expenses apportioned by product type, which are equal to 2479 lei.

#### **Activity Based Costing ABC**

To apply the ABC method, we follow an algorithm by going through the stages specific to this calculation method, namely:

##### **1. Identification of specific activities and costs**

a. The activity of launch in manufacturing: in this activity are included expenses with inventory items and other expenses with services performed by third parties and their value is 950 lei.

b. Processing activity: that includes energy and water expenses (700 lei)

c. The activity of operating the machine, which includes depreciation expenses and maintenance and repair costs (1000 lei).

##### **2. Establishing the inductors for each activity**

a. The activity of launch in manufacturing- quantity of wine produced

White wine -1000 l

b Processing activity -number of direct labor hours

1 hour direct labor/l wine

c. The activity of operating the machine- equipment operating hours

0.5 hour equipment operation/ l wine

**3. Absorbtion of indirect costs through the ABC method.** In this stage is determined the total volume of the inductors

Quantity of wine -1000 l

Number of direct labor hours- 1000 hours (1000 l\*1hour)

Equipment operating hours-500 hour (1000 l\*0.5 In next stage is determined the unit cost of the inductors (table 3).

Finally, we can calculate the indirect costs of activities per product type by multiplying the unit cost of inductors by the volume of inductors consumed.

## RESULTS AND DISCUSSIONS

The first stage in the calculation of costs is represented by the primary distribution of expenses from financial accounting by department (table 1).

Table 1

The primary distribution of expenses from financial accounting by department

Expense elements from financial accounting	Production department	Indirect production costs	Administrative department expenses	Sales department expenses	Auxiliary expenses	Total
Expenses with raw materials	1200					1200
Consumables expenses	1000					1000
Energy and water expenses		700				500
Expenses with inventory items		400	100	100	50	500
Salary costs	1500					1500
Depreciation expenses		500			200	700
Maintenance and repair costs		300				300
Other expenses with services performed by third parties		500				500
<b>TOTAL</b>	<b>3700</b>	<b>2400</b>	<b>100</b>	<b>100</b>	<b>250</b>	<b>6200</b>

In the table below (table 2) is determined the cost of production and the cost sheet is developed using the traditional method. According to this method, the value of the unit production cost is equal to 6.17 lei.

Table 2

Determining the unit cost of production by traditional method

Cost elements	Wine
Expenses with raw materials	1200
Consumables expenses	1000
Salary costs	1500
<b>Total direct expenses (primary cost)</b>	<b>3700</b>
Indirect expenses distributed by the traditional method	2479
<b>Total production cost</b>	<b>6179</b>
Quantity	1000
<b>Unit production cost</b>	<b>6.17</b>

The unit cost for each inductor is presented below (table 3). Their values are calculated by relating the cost of activities to the volume of inductors. It can be observed that for the activity of launch in manufacturing we obtained an inductor equal to 0.95, for the processing activity we

obtained an inductor equal to 0.7 and for the activity of operating the machine we obtained a inductor equal to 2.

Table 3

Unit cost inductors

Activity	Total cost	Inductors	Volume inductors	Unit cost ind.
The activity of launch in manufacturing	950	Quantity wine (l)	1000	0.95
Processing activity	700	Number of direct labor hours	1000	0.7
The activity of operating the 3machine	1000	Equipment operating hours	500	2

We have presented the total value of the indirect costs fixed by product type (table 4). This is calculated according to the ABC method and is equal to 2650 lei. In the first, was calculated the cost of the activity of launch in manufacturing (950 lei), the cost of processing activity (700 lei), and the cost of activity of operating the machine cost (1000 lei).

Table 4

Indirect costs of activities per product type	
Specifications	Wine
Quantity	1000 l
Number of direct labor hours	1000 hours
Equipment operating hours	500 hours
The activity of launch in manufacturing cost (0,95x1000l)	950 lei
Processing activity (0,7x 1000 ore)	700 lei
The activity of operating the machine cost (2 x 500 ore)	1000 lei
Total indirect costs fixed by product type	2650 lei

In the table below (*table 5*) is determined the cost of production and the cost sheet is developed using the ABC method. According to this method, the value of the unit production cost is equal to 6.35 lei.

Table 5

Determining the unit cost of production by ABC method	
Cost elements	Wine
Expenses with raw materials	1200
Consumables expenses	1000
Salary costs	1500
Total direct expenses (primary cost)	3700
Indirect expenses distributed by the ABC method	2650
Total production cost	6350
Quantity	1000
Unit production cost	6.35

## CONCLUSIONS

Analyzing the cost sheets developed by these two calculation methods, we can see that the values of the unit costs differ from one method to another. Through the traditional method was obtained a unit cost of 6.17 lei/L and through the

ABC method was obtained a unit cost of 6.35 lei/L, resulting a higher value by using the ABC method.

A more simplistic approach takes place through the traditional method of calculation, this does not allow a detailed analysis of all cost generating elements. Instead, with the ABC calculation method, the costs are allocated to the activities, and then the costs are allocated to the products that used those activities. Practically, the distribution of expenses is more efficient because it allows a better analysis of the elements that generated the costs.

Both calculation methods have common elements, but also differences, but it is clear, that the ABC Method provides more relevant information because the results are generated by the absolute inclusion of all activities involved in the manufacture of a product.

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