
**PROPOSING MEASURES TO IMPROVE THE DISTRIBUTION OF MILK
OBTAINED FROM CATTLE**

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***Abstract:** Improving the distribution of milk obtained from cattle for milk production involves the identification of specific milk distribution systems, conducting a case study on the distribution system of milk obtained from cattle for milk production using vending machines from Timisoara. Four types of milk distribution systems have been identified: the cash & carry system (pay and transport), the coupon system, customers are given a set of prepaid coupons, and customers receive milk in exchange for coupons, the card system milk printed and sold to customers with advance payment, with a validity limited to one month and the system with vending machines or milk dispensers, the consumer can buy milk by inserting coins or banknotes in the machine and take the milk in his own container or containers provided even by the distributor.*

Key words: measures, milk, distribution, cattle

INTRODUCTION

The factors that help to distribute raw and/or pasteurized milk are, according to [5,6,9,11]:

- the cost of distribution/delivery of milk;
- perishable nature of milk;
- maintaining the quality and type of milk;
- risk of contamination;
- proper supervision and control in distribution.

In areas with temperate and sub-temperate climates, fresh milk is distributed directly to consumers [4,10,14]. If milk production is closely monitored and a short period of time elapses between production and consumption, raw milk may be distributed in this way provided that the temperature of the milk does not exceed 10° C on delivery. Consumption of raw milk is possible in rural areas, but strict hygienic control is required to see if the milk is of good quality [2,3,13].

Deterioration of pasteurized milk quality is mainly caused by post-pasteurization contamination factors:

- the density of the buildings in the respective locality;
- the distance to the dairy farm [1,7,8,];
- number of customers;
- milk temperature on delivery;
- type of delivery vehicles;
- topography of the area;
- store sales vs. home delivery.

Generally, milk is distributed in containers such as:

- sealed boxes;
- polyethylene bags or tetra pack (plasticized cardboard);
- bottles.

Safe milk distribution systems are essential for:

- the efficiency of a well-organized retail sale of milk;
- simple, convenient for both farmer and customers.

MATERIAL AND METHOD

In order to determine measures to improve the distribution of milk, we undertook studies on four special types of milk distribution, analyzing each of them both advantages and disadvantages, and finally we undertook a study on the distribution of milk from different farms on the market from the city of Timisoara.

RESEARCH RESULTS

There are four types of milk distribution systems:

- the cash & carry system, in which customers have to pay the cost of milk to sellers at the time of delivery of milk, which has advantages and disadvantages:

Benefits:

- the sellers' commission can be calculated easily and promptly;
- the account of each calendar month can be closed in time;
- recording milk sales is easy;
- no additional cost is involved in printing coupons/cards;

Disadvantages:

- there is a risk of embezzlement of money by sellers;
 - there is a risk of losing money due to theft from the pockets;
 - lack of money is a difficulty for customers eager to buy milk;
 - handling large quantities of coins and banknotes;
 - a daily counting of money is not an easy job.
- the coupon system, in which customers are given a set of prepaid coupons and customers receive milk in exchange for coupons and purchase a new coupon brochure when they run out:

Benefits:

- dairy farm receives the money in advance and can use it profitably;
- counting coupons is easy;
- the risk of losing money is eliminated;
- milk sales are uniform even at the end of the month;

Disadvantages:

- the calculation of milk revenues at the end of the calendar month may not be as clear as in the cash & carry system;
 - there is the inconvenience of repurchasing unused coupons;
 - printing fake coupons;
 - the value of returned coupons cannot be easily calculated;
- the system of milk cards printed and sold to customers with advance payment, with a validity limited to one month, without a fixed issue date, but with an established expiry date, and with reimbursement of the cost of unpurchased milk for 1-2 days

Benefits:

- the value of the milk is received in advance and can be used profitably;
- eliminates the problems related to the daily counting of money/coupons;
- it ensures the milk market;
- it eliminates the risk of losing money;

Disadvantages:

- customers must pick up milk only from the designated places;
- the monthly account of the actual sale of milk cannot be closed due to the reimbursement of the value of the unpurchased milk;
- printing and issuing milk cards and reimbursing involves a large amount of work and time;

- reimbursement of the value of unpurchased milk causes great inconvenience to both customers and farms;
- sellers may sell milk to customers other than cardholders;
- the system with vending machines or dispensers for milk, the capacity of which capacity varies from 1,000 to 1,300 l each, from which the consumer can buy milk by inserting coins or banknotes into the machine and take the milk in his own container or containers provided even by the distributor.

In March 2010, the website <https://www.ecomagazin.ro/> headlined "High-tech milkers fill the Romanian markets with <automatic live milk dispensers>". "Outraged that the processors buy their milk in mockery, below the production price, several dozen farmers from all areas of Romania took revenge by buying automatic dispensers of fresh milk that they placed in the markets, where they sell the liter with a profit margin of 30-45%, a percentage found in Romania only for the telecom giants Orange and Vodafone. The milkers revolution started in Timisoara, in May 2009, when the owner of a farm with 150 cows, Viorel Hapenciuc, imported, from Italy, the first vending machine with 21,000 EURO + VAT. It went so well that now it sells all its milk production, of 2000 l, through the five dispensers <Joiana> located in the ford markets from the city”.

In October 2021, according to some local websites, there were 16 milk vending machines/distributors/dispensers/vending machines in Timisoara, from which:

- 15 operated non-stop;
- 8 supplied Joiana brand milk from the Vascuța-Stolnici farm (Figure 1):
 - Dambovita Boulevard, corner with Ana Ipatescu Street;
 - Dacia Square, Burebista Street;
 - Doina Square, Mures Street;
 - Iosefin Square, Iancu Vacarescu Street;
 - Lipovei Square, Silistra Street;
 - Green Square, Liège Street;
 - Strada Astrilor;
 - Vasile Lucaci Street;



Figure 1. Joiana brand logo and vending machine

8 supplied Liebling brand milk from Liebling (Figure 2)

- Buzisului, Buzias Street no. 28;
- Iulius Town, 1 Aristide Demetriade Street;
- Kaufland 1, Gheorghe Lazar Street;
- Kaufland 2, Pavel Vasici Ungureanu Street;
- Profi Aries, Aries Street;
- Profi Lipovei, Calea Sever Bocu;
- Profi Printul Turcesc, Ion Mihalache Street no. 25-27;
- Profi Sagului, Calea Sagului.

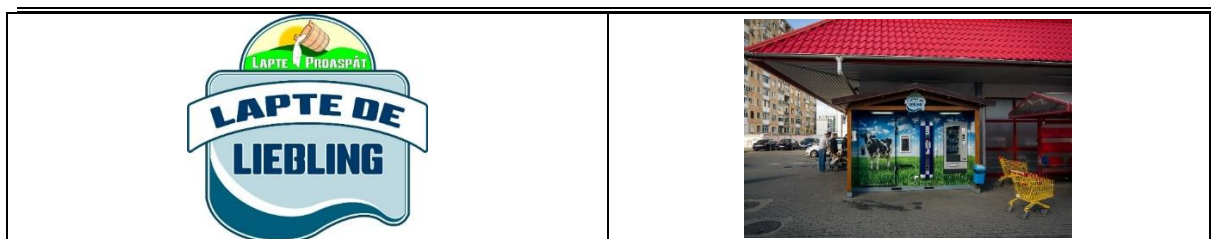


Figure 2. Liebling logo and vending machine

According to the website [16] the milk vending machine has the most diverse and complex characteristics:

- "ensures the intelligent link between temperature control and payment systems, offering the possibility of a flexible setting of temperature ranges and the maximum time during which the machine is allowed to operate outside them;
- it is compact, meaning it uses every cubic centimeter of space of the dairy machine intelligently;
- it is eco-friendly, meaning it guarantees a minimum electricity consumption;
- it is made entirely, both inside and outside, of food grade stainless steel;
- it is flexible from the point of view of the payment of the product, meaning it is provided with banknote readers adapted for Romanian plastic banknotes and coin readers with or without the granting of rest;
- it is provided with self-exchange, meaning it has two tanks: at the end of the milk from one tank, the machine automatically switches the dosage to the other tank, without the intervention of the human factor for the exact filling of the customer's bottle;
- is pro-customer, meaning is the result of the experience of over 16 years of relationships with customers using dairy vending machines, from all backgrounds and age groups;
- is an anti-freeze system, meaning a system that ensures the impeccable operation of vending machines installed in geographical areas where temperatures often drop below -5°C in winter, through the intelligent use of the defrost system as a heater;
- it is a self-washing system, meaning the operation of washing the dosing system piping, pump, valves and flow meter is done at the place of installation of the dispenser, in record time, automated, by pressing a single button;
- is a flow-meter system, meaning a system that accurately measures the quantities of milk per milliliter;
- is a GPS system, meaning a system that works on the basis of an integrated GSM module in which a standard mobile phone card is inserted: in this way, the machine will function as an interlocutor who notifies the farmer whenever the machine an important event occur
- is a super-info system, meaning a system that offers the most varied palette of information in electronic format in the form of computerized meters, on: Total sales, Coin value in the token, Number of sales, Payments in banknotes, Rest granted, Number of sales without remainder, Handout, Number of current outages, Number of system resets, etc.;
- is an ultrasonic system, meaning a system that permanently monitors the physical level of milk inside the tank by means of a special ultrasonic sensor mounted independently without contact with milk or containers;
- is a pro-agitator system, meaning a system which has milk agitation systems for the homogeneous dispersion of fat globules controlled by an automatic timer;

- monitors the milk temperature through the total, computerized control of the temperature inside the enclosure in which the milk tanks are located;
- allows the printing and issuance of the printed tax receipt to each customer, including standard information with the milk manufacturer's logo and address, date of supply, expiry date, exact date and time of dosing, price per liter, amount entered, quantity of milk received and so on returned to the customer ”.

The qualitative analysis of the opinions of the people of Timisoara about these vendomats explains the popularity they enjoy [15]:

- in pandemic conditions, buying milk from a vending machine means less direct contact with other buyers and/or sellers;
- encouraging small local producers in a city with hypermarkets (Auchan, Carrefour, Kaufland, Lidl, Penny, Profi) in the heart of the city;
- the milk is natural, not made from powdered or skimmed milk;
- price of only 4 RON/l, meaning 60% from the price of a liter of milk sold in hypermarkets.

There are, however, opinions against these milk vending machines [15]:

- the sanitation of the vending machines is not done properly;
- local producers are just ”local mobsters”.

CONCLUSIONS

In order to improve the distribution of milk obtained from cattle, they identified four types of distribution systems, namely: the first is the cash & carry system characterized through the that customers have to pay the cost of milk to sellers right at the time of milk delivery, the second system is the one with coupons, in which case consumers are issued coupons for prepayment, receiving milk in exchange for coupons, the third is the system with printed milk cards and sold to customers with prepayment and finally the system with vending machines or dispensers, which is also applied in Timisoara.

The milk distribution system with the help of vending machines or dispensers was also a special solution for capitalizing milk in the period we are going through, the pandemic, because buying milk from a vending machine requires less direct contact with other buyers and/or sellers. A strong point of this system is the fact that it encourages small local producers, and consumers are extremely satisfied with the quality-price ratio of milk that is thus capitalized.

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