

Report on Feeding Experiment

Project: Modernization, Innovation and Use of Knowledge for the
Moldovan Dairy Sector (MILK)

COUNTRY	Moldova
REGION, RAIONS	Northern Region , in the following raions: Edineț, Glodeni, Ocnîța, Rîșcani, Soroca
DONOR	Czech Development Agency
SECTORAL ORIENTATION OF THE PROJECT	Agriculture and rural development
ACTIVITY	A2.2.3. Conducting an experiment with a farming community on best practices for cattle feeding
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ACRONIMS:

PIN People in Need

HH Household

MCC Milk Collecting Centres

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BACKGROUND AND CONTEXT

MILK PROJECT

Moldovan farmers (small and medium) have the potential to develop and expand their milk production. The country offers a good climate for high producing dairy cows in the highlands since there is fertile soil and sufficient precipitation that create good conditions for high fodder production. However, the small and medium farmers, who are the cornerstone of the dairy sector in Moldova, are currently facing existential problems and several challenges that threaten the development of the local milk market. Despite favorable conditions for agriculture, Moldova's development is hampered by low value-added economic models, limited export competitiveness, low access to technology, know-how and support services. Compared to other economic sectors, Moldovan agriculture has the highest poverty rate; the dairy sector in particular has been in steady decline since 1990. In the last ten years alone, cattle populations have fallen by around 33%, including dairy cows, which have fallen by around 43%.

One of the project's goal is to create regional platforms for the coordination of the dairy sector, strengthen the capacity of MCCs, improve farmers' access to veterinary advice and also ensure access to quality genetic material for crossbreeding. As a result, the project will strengthen the efficiency and cooperation of market participants throughout the dairy value chain and increase the productivity and milk quality of small and medium-sized cattle farmers.

CONTEXT OF THE ACTIVITY

Activity A2.2.3 involved conducting an experiment with a farming community to explore the best practices for cattle feeding. The main objective was to familiarize small and medium-sized farmers with more advantageous and nutritious methods of feeding their cattle. The experiment was executed through a behaviour change methodology and progressed through several distinct phases.

The experiment unfolded as follows:

Preparation Phase: Initially, the destination for the experiment was identified, followed by a community meeting where participants were informed about the upcoming experiment. Qualitative data was collected through identification interviews with target farmers to provide insights.

Basic Data Collection Phase (7 days): Farmers and the research team started collecting data on milk volume and quality while maintaining their existing cattle feeding practices.

Hay Feeding Phase (15 days): During this phase, participants received hay to feed their dairy cows. Data collection continued to monitor the effects of the new feeding method.

Hay and Concentrate Feeding Phase (15 days): In this phase, participants were provided with both hay and concentrated feed to feed their dairy cows. Detailed records were maintained to track the outcomes of this combined feeding approach.

Data Evaluation and Final Meeting with Farmers: After collecting data from the experiment, an expert analysed the information. The findings were presented during a final meeting attended by the participants, where the collected data was discussed and interpreted.

Overall, the method employed in this activity aimed to transform the behaviour of the target audience, namely small and medium-sized farmers, by educating them about improved and more nutritious

approaches to cattle feeding. The experiment followed a systematic structure encompassing various phases, each contributing to the acquisition of valuable data. The ultimate intention was to employ this data to raise awareness among farmers about effective cattle feeding practices and to underscore the economic advantages of investing in better feed options.

METHODOLOGY

FEEDING EXPERIMENT OBJECTIVES

The feeding experiment aimed to assess the effects of different feeding strategies, including hay and concentrate supplementation. The objectives were to determine the impact of these practices on milk volume, cattle well-being, and financial gains, ultimately providing valuable insights into the feasibility and benefits of adopting these alternative feeding methods in the context of small and medium-sized farming operations.

DATA COLLECTION METHODOLOGY

The methodology employed for the feeding experiment involved a two-phase approach. In the first phase, a preliminary questionnaire was administered to gather baseline information and preferences from the 26 participating households with a collective of 40 dairy cows. Subsequently, in the second phase, the identified feeding practices, including hay and concentrate supplementation, were implemented and observed. Following a defined period, a second questionnaire was administered to evaluate the participants' experiences and outcomes related to milk volume, cattle well-being, and financial gains resulting from the adopted feeding strategies. This approach facilitated a comprehensive analysis of the effects of the different feeding methods on the dairy cattle and the participating farmers' overall agricultural practices.

RESEARCHING QUESTIONS

The following set of research questions guided the research into the relationship between cattle feeding practices and their consequential impacts on milk production and economic returns:

1. How does feeding hay to cattle impact milk volume and quality?
2. What are the reasons some farmers have not tried feeding hay to their cattle?
3. What are the specific factors that farmers like about feeding hay to their cattle?
4. How does feeding hay affect the weight gain of cattle?
5. What are the main concerns or dislikes farmers have about feeding hay to their cattle?
6. How does feeding hay to cattle influence farmers' financial income?
7. What are the factors influencing farmers' decisions to continue or discontinue alfalfa hay feeding practices?
8. What are the benefits and drawbacks of combining hay and concentrate feeding for cattle?
9. How does the combination of hay and concentrate feeding affect milk volume in cattle?
10. What financial implications are associated with feeding hay and concentrate to cattle?
11. How does the implementation of different feeding practices impact the volume of milk produced by cattle?
12. What is the range of monthly costs for hay and concentrate feeding practices among farmers?

FEEDING EXPERIMENT: PERCEPTIONS AND OUTCOMES

This section presents the findings and analysis of an experiment conducted to assess the impact of different feeding practices on cattle, particularly focusing on hay and concentrate supplementation. The goal was to understand farmers' experiences, preferences, and outcomes associated with these feeding methods. The experiment involved 26 participants, and their responses have been compiled and analyzed for insights.

DEMOGRAPHICS AND INCOME

The respondents were categorized into three age groups, and the distribution is as follows:

- Age Group 35-60: There were 18 respondents (69%) falling within the age range of 35 to 60 years.
- Age Group 60+: 7 respondents (27%) belonged to the age group of 60 years and above.
- Age Group Below 35: Only 1 respondent (4%) was categorized as being below the age of 35.

In total, the survey included responses from 26 participants. The absence of young farmers in the feeding experiment can be attributed to the limited number of youths (aged below 35) who possess cattle within their households. Half of the respondents live in a HH with 3 or more members while 42 % live in a HH with one or two members. Two of the respondents refused to provide such information.

The majority, constituting 65% of respondents, owned a single dairy cow. Meanwhile, 27% of participants reported having two dairy cattle. A smaller fraction of participants, 4% (1 respondent) each, indicated ownership of either three or five dairy cows. For vast majority of the respondents (22 or 85%) the income generated by the selling of the milk or/and dairy products is the main one. Only 4 (15%) of the beneficiaries stated that they also have salary as an income source.

Nutritious options used

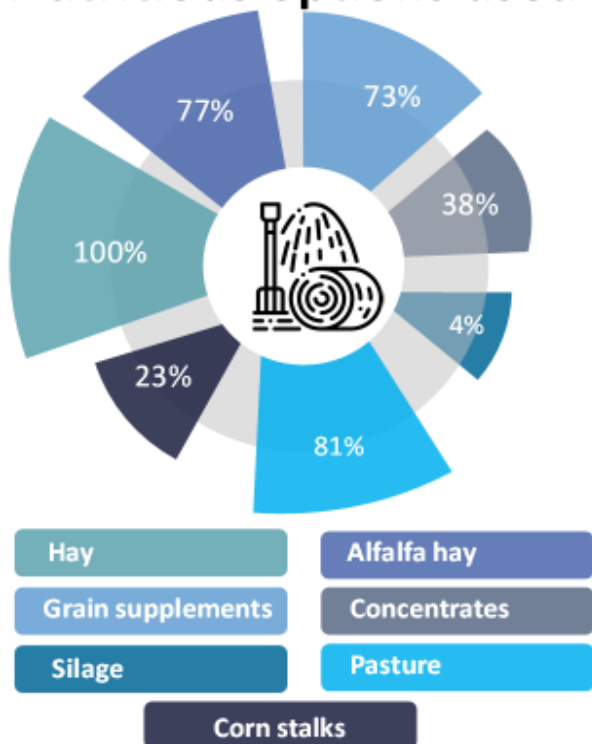


Figure 1. Nutritious options typically used by farmers before the feeding experiment.

A quarter of the participants (25%) reported that the decision regarding cattle feeding is made through a household collaborative approach to this aspect. On the other hand, nearly half of the cases (45%) indicated that the responsibility falls on males. Additionally, the females decide what to feed the cattle in 30 % of the cases.

CATTLE NUTRITION OPTIONS

When it comes to the typical feed for their cattle, participants reported utilizing a range of options. Grass hay emerged as the predominant choice, with all respondents (100%) indicating its usage. Alfalfa hay was commonly employed as well, with 77% of participants (20) opting for this feed (Figure 1).

Analyzing the possible alterations in animal feed practices across seasons, the survey findings highlight that the majority of participants, constituting 88%, indeed opt for varying feed options for their cattle. Conversely, a smaller fraction, accounting for 12% of participants, indicated that they do not alter their animal feed practices based on seasonal fluctuations.

Pasture emerged as the cornerstone of summer feeding, with all participants (100%) opting for this natural source of nutrition. Out of all respondents 27% chose to rely solely on pasture. A significant portion of survey participants (58%) combine pasture with shredded cereals. Moreover, 8% of participants integrated grain supplements with pasture to ensure a well-rounded diet, while another 8% incorporated alfalfa hay and grain supplements into their cattle's summer feeding routine.

Conversely, during the winter months, participants primarily relied on hay, lucerne, and shredded cereals, accounting for 81% of the responses. Other practices included incorporating cornstalks and cereals into the feed, making up 12% of the responses. The participants also combined grass hay, cereals, and cornstalks to formulate a balanced diet, representing 12% of the responses. All of the beneficiaries that took part in the survey grow crops or/and plants on their farm/land for the primary purpose of feeding dairy cattle. Most of them (65% or 17) grow cereals. The second most popular answer is alfalfa - 62% or 16 respondents. Grass and corn silage were chosen by 13 (50%) and 11 (42%) of the respondents accordingly. The beneficiaries were asked if they used concentrated feed in the last 5 years and only 4 (15%) answered affirmatively.

CATTLE FEED PURCHASE

Out of 26 beneficiaries that took part in the survey 81% or 21 buy at least one type of cattle feed (Figure 2). Also, the respondents were asked what they appreciate about the current animal feeding practice.

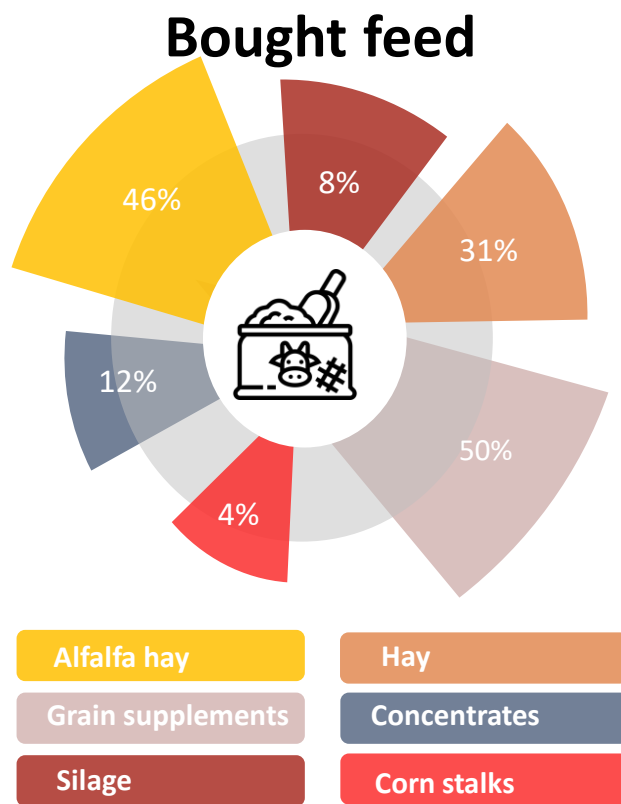


Figure 2. Feed bought during last 12 months period by farmers of the feeding experiment.

Out of all respondents 42% (11 out of 26) expressed appreciation for the convenience of buying the feed at the local level, supporting local economies and ensuring a readily available supply. At the same time 35% (9 out of 26) of respondents valued the fact that this feed was accessible throughout the year, guaranteeing consistent nourishment regardless of the season. Another 2 or 8% of respondents found its cost-effectiveness to be a major advantage. Equally, 2 liked that the animal feed was easy to grow, simplifying the process of providing sustenance to their livestock.

In the same survey was also explored the aspects of the current animal feeding practice that were disliked or considered challenging. Notably, a substantial 62% (16 out of 26) of respondents expressed their dissatisfaction with the practice's cost, finding it expensive and financially burdensome. This emerged as the most significant concern among those surveyed.

Furthermore, 23% (6 out of 26) of participants highlighted the limitation of land for cultivating grass or feed crops as a significant challenge in providing adequate sustenance for their cattle. Additionally, 15% (4 out of 26) of respondents found it difficult to store the animal feed properly, which could lead to

spoilage and wastage, posing a logistical challenge. Lastly, another 15% (4 out of 26) of participants encountered difficulties in buying or collecting the required animal feed, indicating potential accessibility issues in their region.

MILK PRODUCTION

The biggest part of the respondents (65%, 17) yield an average of 6-15 liters of milk daily. At the same time 31% (8 respondents) yield 16 to 25 liters a day. Only one respondent stated that the quantity of milk equals from 60 to 62 liters. This particular case the beneficiaries have 5 cattle. Also, the beneficiaries were asked what is the price that they get from MCC for one liter of milk. The prices range from 3.5 MDL (0.17 EUR) to 6.00 MDL (0.30 EUR). In terms of milk retained for household consumption, there is a noticeable variation, with answers from 1% to 20%, indicating that, on average, households consume roughly 11% of the milk produced.

All of the respondents that took part in the survey, after the experiment was concluded, intent to increase the amount of the milk that they produce. Their strategies for achieving this goal vary, with 15 (58%) considering a change in animal feed, 11 respondents (42%) planning to produce more feed, 10 (38%) intending to increase the number of dairy cows, 6 (23%) planning to buy more feed for their animals and another 6 (23%) intending to invest more in controlling animal diseases. These diverse approaches highlight the participants' commitment to enhancing their milk production and suggest a willingness to explore multiple avenues to achieve their objectives.

Only 3 respondents (12%) don't see any constraints to the dairy production of their farm. Out of the rest of 23 respondents 11 (42%) think that the most important one is related to the low market price of milk, while the equal number of 6 participants (23%) in the survey think that the biggest constraint is related to lack of fodder or feed and high price of cattle feed (concentrate feed) accordingly.

FEEDING EXPERIMENT'S OUTCOMES

The majority of respondents (96%) have tried feeding hay to their cattle. However, one respondent indicated they had not tried feeding hay due to issues with the quality of the alfalfa from the first harvest, as it was too hard for the cows to eat.

The majority of respondents had a positive experience with feeding hay to their cattle, while a smaller proportion had reservations or encountered issues. Approximately 96% (25 out of 26) of the respondents liked feeding hay to their cattle. This majority found various benefits, including an increase in milk quantity (40%), the cattle was fed/calmer cattle (36%), increased cattle weight (16%) and that the feed was free (12%). Approximately 19% (5 out of 26) of the respondents also revealed issues with the quality of alfalfa, with some cattle not eating it, and a perceived lack of significant increase in milk production.

Overall, half of respondents saw no significant change in their financial income from feeding hay to their cattle. At the same time 10 participants in the experiment (38%) noticed an increase of their income while only one respondent stated that the income decreased.

Based on the responses regarding the continuation of alfalfa hay feeding practice, approximately 92% (24 out of 26) of the respondents expressed their intention to continue the practice. Reasons for continuing included expectations of better results with a longer experiment, increases in milk production and income (21%, 5), the preference of cattle for this type of feed (12%, 3), and it being a good practice before calving (8%, 2). A percentage of 36% (9 out of 25), did not specify reasons but still intended to continue.

A few respondents, approximately 13% (3 out of 23), mentioned potential conditions for continuing, such as only doing so if they had their own alfalfa or if it was in combination with concentrate.

Overall, the majority of respondents (96%) showed a willingness to recommend the alfalfa hay feeding practice to others, primarily due to the positive impact it had on milk production and income, as well as its benefits for cattle health and preference.

To all participants of the feeding experiment was offered hay and concentrate for cattle feed but only 69% (18 respondents) tried feeding it to the cattle during the experiment. The rest of 8 respondents stated that the reason for not adopting this feeding practice was that the cattle calved and they kept the concentrate for later. The duration for which respondents tried feeding hay and concentrate to their cattle varied, with most trying it for either 0.5 months (50%, 13 respondents) or 1 month (19%, 5 respondents).

The results from the survey indicate that all 18 respondents that tried feeding their cattle with concentrate liked this practice. The primary reason for their satisfaction was the significant increase in milk production that they observed (78%). Some respondents (17%) also mentioned as one of the benefits that their cattle were well-fed. One respondent mentioned an increase in fat percentage, and another highlighted improvement in both the quantity and quality of milk production.

Even if all of the respondents liked the practice of feeding concentrate to their cattle there were three of them who pointed some issues linked to this type of feed. They cited the high price of concentrate as the primary reason for their dissatisfaction with this feeding practice. This suggests that cost considerations were a significant factor in their decision not to continue with this approach.

Approximately 72% (14 out of 18) of the respondents that tried feeding their cattle with concentrate reported that their financial income had increased as a result of this feeding practice. About 17% (3 respondents) stated that their financial income remained the same while one reported a decrease in financial income.

Based on the responses regarding whether respondents would continue with the practice of feeding hay and concentrate to cattle approximately 89% (16 out of 18) of the respondents expressed their intention to continue with this practice. Reasons for continuing included viewing it as a good practice and the perception that the practice increase in production and income. A limited percentage, approximately 11% (2 out of 18), mentioned they would continue only if the prices were more affordable.

With the exception of one respondent, all those who attempted feeding hay and concentrate to their cattle would recommend this practice to others. The reasons for recommending it included the potential for more milk production leading to increased income. The others mentioned the investment in feed being worth it and the expectation that the income would grow as a result. One respondent specified that their recommendation would be conditional, suggesting they would advise it only if others were able to produce their own concentrate. Additionally, another respondent cited the high price as a deterrent to their recommendation.

The majority of respondents (57%, 15 out of 26) reported that the volume of milk produced increased during the period of feeding experiment. Among those who reported an increase, the average increase in the volume of milk in liters was approximately 4.1 liters. However, it's important to note that the reported increases varied, with some respondents indicating specific numbers such as 2, 4, 8, and 10 liters, among

others. **All the respondents who reported that the volume of milk produced remained the same during this period mentioned they did not incorporate concentrate into their feeding practices.**

CONCLUSION AND RECOMMENDATIONS

The experiment revealed that both hay and concentrate feeding methods positively influenced milk volume and income. Participants expressed enthusiasm for these practices due to observed benefits. The majority were willing to continue and recommended these practices to others. The findings underscore the significance of nutrition in cattle feeding and its direct impact on productivity and financial gains.

Diversify Feed Options for Cattle: Participants commonly utilized grass hay and alfalfa hay for cattle feed, even before the experiment. To ensure a well-rounded and cost-effective diet, it is recommended that cattle farmers explore diverse feed options that suit their region and cattle's nutritional needs. This can include a mix of natural sources like pasture and supplemented feeds.

Consider Seasonal Variations: A significant portion of participants altered their animal feed practices based on seasonal changes. This approach aligns with best practices for cattle nutrition. It is advised that farmers continue to adapt their feed practices according to seasonal fluctuations to optimize cattle health and production.

Efficient Pasture Use: Participants relied heavily on pasture during the summer months. Maximizing the utilization of pasture as a natural source of nutrition can help reduce feeding costs and support healthy cattle. Encouraging efficient pasture management is essential.

Address Cost Concerns: Cost emerged as a significant concern among participants. To address this, farmers can explore cost-effective feed options, consider local and seasonal variations in feed prices, and assess the feasibility of growing their own feed crops to reduce expenses.

Increase Milk Production: Many participants expressed a desire to increase milk production. To achieve this goal, farmers can consider various strategies, including optimizing animal feed, expanding feed production, increasing the number of dairy cows, and investing in disease control measures.

Market Price and Fodder Concerns: Some participants identified market prices for milk and the availability of fodder as significant constraints to dairy production. It is recommended that farmers explore marketing strategies to improve their milk prices and seek sustainable solutions for fodder supply, such as growing their own feed crops.

Continue feeding practices used in the feeding experiment: Participants reported positive outcomes from feeding experiments, particularly when using concentrate. Farmers can consider incorporating concentrate into their regular feeding practices, but it's essential to evaluate the cost-effectiveness and financial feasibility, especially in cases where price concerns were raised.

Monitor Milk Production and Quality: To further enhance milk production, farmers should consistently monitor the quantity and quality of milk produced. Keeping detailed records can help identify trends and opportunities for improvement.

Continue Research and Education: Farmers should stay informed about advancements in cattle nutrition and farming practices. Accessing resources and education on modern cattle nutrition techniques can lead to improved production and overall farm sustainability.