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An Assessment of The Clean Milk Production Practices in Basra Province

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Abstract: Safe and healthy milk production and consumption is a major concern and the adoption of food safety measures at farm level can play a critical role in ensuring the quality and safety of milk. The current study aimed at examining the factors affecting the assessment of acceptance or rejection rates for milk produced by smallholders in Basra Governorate, as the data collection was approved by a survey that included 53 farms concentrated in the north and center of Basra Governorate. The primary data was collected according to a comprehensive schedule that covered all the information required for the study using a data collection form. The first part of the study dealt with the aspect related to the social and economic characteristics and assets related to livestock. While the second part of the research dealt with standing on the aspects of the farm, which included the type and number of animals in the farm, the average production of milk and how to market it from the milking stage to the selling stage. This period (the stage of animal disease and the stage of taking treatments), in addition to that, the cleanliness of the place designated for milking and the milk storage area. The study concluded that there is a low level about clean milk production practices in Basra Governorate, as not all breeders take into account the periodic examination of animals, as well as a decrease in the level of some important factors for the production of clean milk, most notably the cleanliness of pots by using detergents and the use of clean customized clothes when milking as well as milking livestock near the Animals. The study also recommends that the relevant authorities follow up on the practices of clean milk production, educate the breeders about the methods of clean milking, and visit the animals periodically at the veterinary hospital to check the health of the milking animals.

Keywords: Basra, cattle, milking, milk storage, sterilization.

1. INTRODUCTION

For humans, milk is a crucial dietary source. Dairy items such as cheese and milk are regarded as primary nutritional foundations. Goats, sheep, and camels are the next greatest milk producers for human use worldwide, after cows. The present study is focused on cow's milk. The number of bacteria, non-pathogenic cells, the presence of impurities, the proportion of fat and protein, and other factors are considered when determining milk quality. Milk is a highly delicate substance, and its quality may be ruined if it is not correctly cared for. Milk care is concerned with keeping milk clean, nutritious, and germ-free from the time it leaves the udder. Because of this, the dairy cow breeder ensures that milk is appropriately produced until it leaves the farm [1].

Ensuring adherence to food safety regulations is needed to reduce the effects of food-borne infections. Developing countries continue to face significant difficulties with this concept[2,3]. Food is a great way to transmit pathogens [4,5,6]. The bulk of milk producers are smallholders in many countries, and the milk is sold through the informal sector [7,8]. There is considerable concern regarding the safety of milk produced by smallholder farmers and sold in informal marketplaces.

The milk collected from the udders of healthy animals is often classified as “clean milk.” Milk is gathered in milking pails that are clean, dry, and devoid of debris such as dust, dirt, flies, hay, and manure. Clean milk is composed of natural ingredients and has a natural taste. It is bacteria-free milk suitable for human consumption [9]. Clean milk production using proper processing procedures is required for healthy and improved milk quality. Whole-natural milk has a balanced composition of milk lactose (4.8%), fat (4%), minerals (0.7%), proteins (3.5%), vitamins, and other minor components such as enzymes and hormones. Regular raw milk has a pH of approximately neutral (pH 6.7) [10].

Mammalian milk offers a complete human diet and is recognized as the principal source of nutrition for people of all ages [11]. Due to its composition, milk is a particularly appropriate growth substrate for microorganisms growing at the surface of the udder, teats, and external surfaces of the animal’s body during milk collection. These microorganisms are introduced via the use of storage equipment as well as a range of other sources, such as the animal barn, workers, and the general working environment [12]. At room temperature, milk nutrients support rapid bacterial growth, which may lead to spoiling. Improper dairy management methods, including milk handling and storage, and fraudulent methods, such as adding water or unauthorized preservatives, may introduce bacteria into milk, resulting in milk spoilage [13].

Once these microbes enter the milk, they may grow quickly and create unwanted changes that reduce milk quality. Low-quality milk and other dairy products may also be a source of human infections that can increase the likelihood of food-borne disease [14]. Therefore, stringent steps must be taken to ensure appropriate dairy hygiene on the farm. Good dairy production procedures, good care for ruminant animal barns, a clean environment, and the health of the people who work on the farm all play essential roles in preventing microbial contamination of fresh milk [15].

Safe and healthy milk production and consumption are critical problems, and farm-level food safety measures may play a crucial role in assuring milk quality and safety. This research aimed to investigate the variables that influence how much milk produced by smallholders in Basra Governorate is accepted or rejected. A survey of 53 farms in the north and center of Basra Governorate was used to acquire the data.

2. MATERIAL AND METHOD

Basra Governorate is located in southern Iraq between 39.5° and 31.20° north and 46.40° and 48.30° east. Basra is divided into seven administrative areas (districts) [16]. Basra is bounded on the north by the governorates of Maysan and Dhi Qar, on the east by Iran, on the south by Kuwait and the Arabian Gulf, and on the west by the governorate of Muthanna [17].

The present research attempted to investigate clean milk production techniques in the Basra province and to identify the animals confronting milk-producing animal breeders in this regard. 53 buffalo, cow, and sheep pastures were randomly chosen and divided around the districts of Basra Governorate (concentrated in the center and north of Basra Governorate) (Fig1).

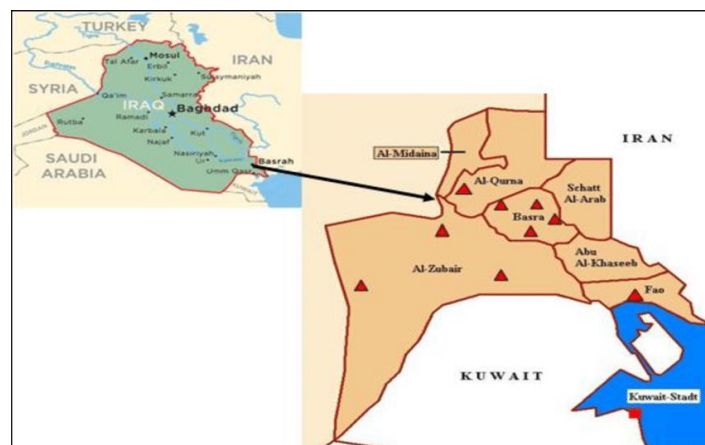


Fig 1. Basra districts involved in the current study [18].

Data was obtained utilizing a data collection form per a detailed schedule encompassing all information necessary for the investigation. The first phase of the research focused on factors related to social and economic features and cattle assets. The breeders provided the data openly and honestly. They were questioned about the informative parts of themselves and

the field. The collected data included the academic level of the milking farmers, their ages, the amount of understanding of milking instructions, and the hygiene measures implemented before and after the milking process. Furthermore, the study collects the courses taken by the milking farmers and their knowledge about sterilization.

The study's second phase focused on the field's unique elements, such as the kind and quantity of animals in the field, the average milk production, and how to promote it from the milking stage to the selling stage. Furthermore, several aspects of animal sickness and therapeutic approaches were investigated, as well as the production and marketing of milk throughout this period (animal disease and taking treatment stages). Furthermore, the cleanliness of the milking area and the milk storage area and what is related to them (the milk storage temperatures, the animal's udder cleaning before milking, the cleaning of the milking utensils, and the method of milking ect.) were examined. Lastly, the study examines whether the animals were checked regularly by a specialist veterinarian.

3. RESULT

The results of the current study showed an apparent discrepancy between the data based on the visit of 53 livestock fields and 415 animals distributed between sheep, buffaloes, and cows, with a daily milk production rate of 13.31 liters per day, as shown in Table 2. Depending on the academic level of the farmers, it was found that all the farmers who were educated and responsible for milking did not have an academic education or only passed primary school. As demonstrated in Table 1, 52.83% of breeders and those responsible for milking do not know how to read or write. Furthermore, it was discovered that all surveyed fields are handled by their owners with no worker. All breeders are uneducated or lack expertise in clean milking techniques, which the relevant institutions should provide. Despite this, it was shown that around 94% had some knowledge of sterilization obtained via different ways, as illustrated in Fig2.

Table 1. Data of the breeders responsible for the milking process.

Factors	Range	Frequency	Percentage
age	18-35	29	54.71%
	36-50	24	45.28%
	51-65	0	0%
	65<	0	0%
Total		53	100%
Education	Not educated	28	52.83%
	Primary school	25	47.16%
	Secondary school	0	0%
	College degree	0	0%
Total		53	100%
Person responsible for milking	field owner	53	100%
	Employee	0	0%
Total		53	100%
Experience with clean milking from institutions	Have experience	0	0
	Have no experience	53	100%
Total		53	100%

Table 2. Average daily production of milk sales (liters/day) for the animals included in the current study.

Animals	Frequency	Average daily milk production (liters/day)
Buffalo	96	7.46
cows	98	4.5
sheep	221	1.35
Total	415	13.31

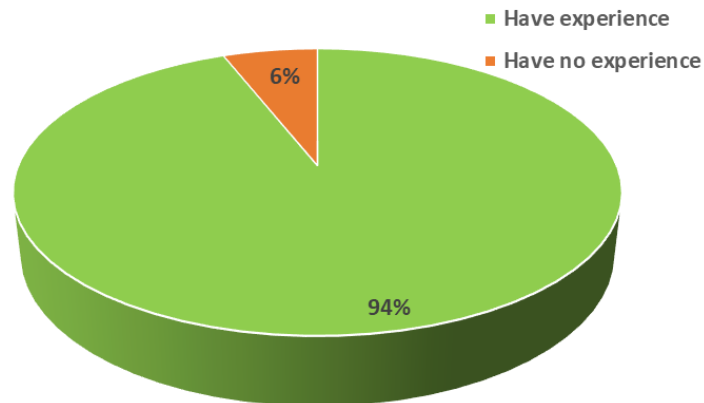


Fig 2. Sterilization information for field owners.

Before the practice of milking, about 47% of the animal breeders reported that they washed their hands with water only. This percentage increased slightly for breeders who washed their hands with water and detergents before milking. None of the breeders used hand cleaning with sterilizers, as shown in Fig3.

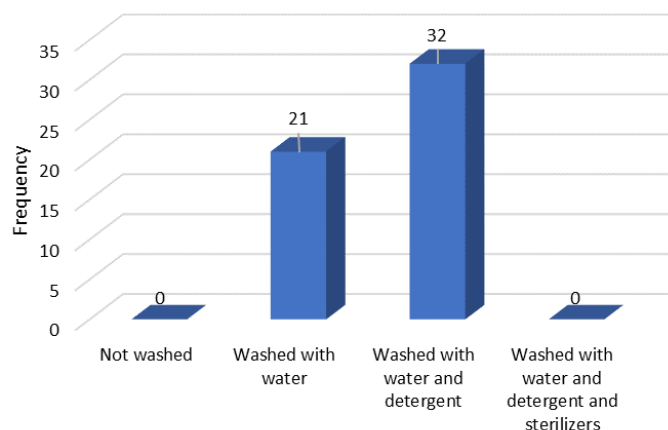


Fig 3. Hand cleaning before milking.

According to the survey, around 41.5% of milkers do not change their clothing because they do not have clean milking clothes, whereas approximately 58.5% use milking garments, as indicated in Fig4. Breeders often sell milk in two ways. According to the present study, about 47% sell milk directly, and 53% sell milk after boiling it, as shown in Fig5.

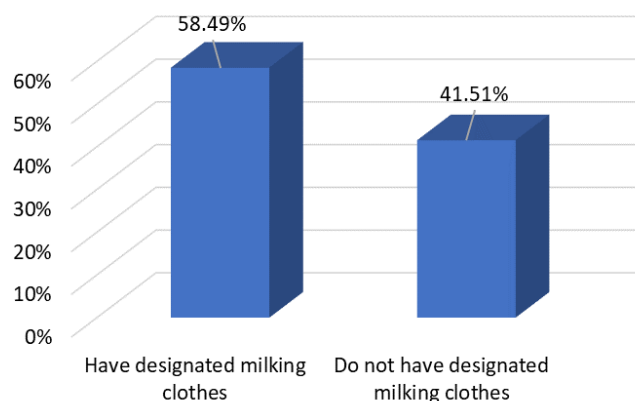


Fig 4. Use clean milking clothes.

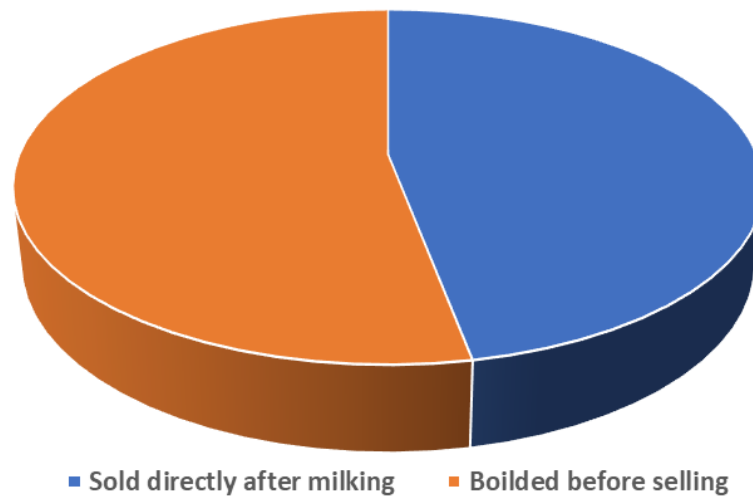


Fig 5. Milk selling.

According to the study, some of the critical factors involved in producing clean milk include: isolating sick cattle, not selling the milk of sick cattle, checking the cattle periodically by a veterinarian, animals milking place, cleaning the udders of cattle before milking, cleaning the milking utensils with water only or with water and detergents, and not milking cattle when using medications. The results showed that about 2% of breeders practice selling milk while giving treatments. In addition, it was found that all breeders do not intend to have the animals examined periodically by a specialist doctor. The results showed that about 80% of breeders milk the cattle close to each other and do not tend to designate a specific and cleaner milking place. They also do not consider the cleaning of the cattle udders of the cattle for all breeders.

Furthermore, as shown in Fig6, 74% of breeders use water-washed utensils in the milk collecting procedure, whereas 26% use detergents to clean the milking utensils. All breeders in the present research considered the cooling conditions in milk storage. There are differences in the location allocated for milk storage, with 15% of breeders keeping milk within the field and 85% storing milk outside the field, as illustrated in Fig7.

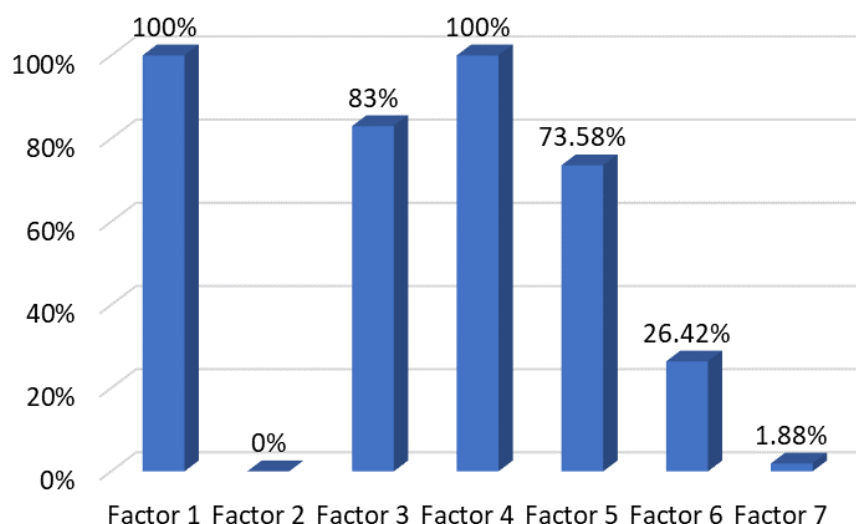


Fig 6. Factors involved in the production of clean milk (Factor 1: Isolating sick cattle and not selling their milk; Factor 2: Checking the cattle periodically by a veterinarian; Factor 3: Milking takes place near the cattle groups; Factor 4: Cleaning the cattle udder before milking; Factor 5: Milking utensils cleaned with water only; Factor 6: Milking utensils cleaned with water and detergents; Factor 7: Milking of cattle when using medications).

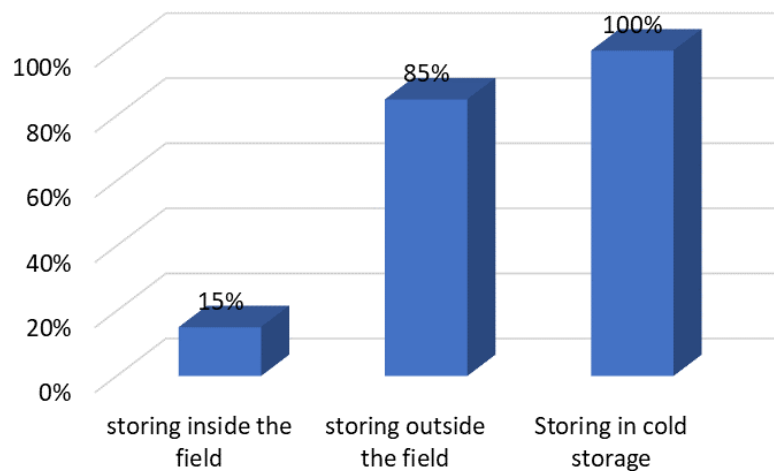


Fig 7. Storage conditions for milk.

4. DISCUSSION

Dairy and dairy products are essential foodstuffs for humans and come second in the value of animal products after meat [19]. Dairy and its derivatives are one of the main pillars of daily human nutrition. Dairy is considered one of the most important food sources because it has many primary nutrients the body needs. It is also a good source of protein because it has essential amino acids, vitamins, minerals, and fats in the right amounts for the body. The nutritional value of milk and its products depends on its quality and safety, which are determined by the number of bacteria, the number of non-pathogenic cells, the presence of impurities, the percentage of fat and protein, and other things. Failure to follow the optimal recommendations may affect human health and livestock together [20]. Many common diseases between humans and animals may be transmitted to humans through milk or dairy products from an infected animal if they are not boiled well.

Human tuberculosis, bovine tuberculosis, brucellosis, or brucellosis, Rift Valley fever, salmonella, and foot and mouth disease, are among the maladies transmitted from livestock to humans. These diseases pose a significant threat to humans [20]. In the current study, the results showed that all farmers who educate and are responsible for milking do not have academic degrees above elementary school, as it was found that 52.83% are unable to read and write. This could make it harder to get clean milk production practices since learning is vital to understanding the instructions and seeing them in the different ways they are given.

Clean milk production is hindered by poor hygiene, malnutrition, a lack of education, and intimate contact with animals. Approximately 45 animal diseases are thought to be spread by livestock. It is always possible for dairy producers to develop an animal-borne infection due to their constant close contact with their livestock. The risk of contaminating milk with human diseases rises when healthy animals are not adequately cared for [21]. The survey showed that about 47% of the breeders wash their hands with water only before milking, while this percentage increases for people who wash their hands with water and detergents before milking. Moreover, none of the breeders used general hand cleaning with disinfectants. The study also showed that about 41.5% do not change their clothes when milking because they do not have clean clothes designated for that, while about 58.5% wear clothes meant for milking.

Milk from healthy animals that has a natural taste, is free of dirt, has no more bacteria than is allowed, and is otherwise devoid of impurities, pathogens, toxins, aberrant residues, and pollutants are considered clean [22]. Milk that has been tainted by pollution spoils quickly and poses health risks. There are several nations where food is a major source of sickness. The term “zoonosis” refers to any infectious illness that may be spread between humans and other animals via natural diseases. A staggering 61% of all human infectious diseases are zoonoses. Animals transmit seventy-five percent of the 175 emergency diseases, which should be highlighted [23]. In the current study, educators lack the standard for practicing clean milk production, as contact with livestock and using the same clothes for milking constitute an unhealthy environment for practicing clean milk production. In addition, it was found from the results that about 47% sell milk directly, and only 53% sell milk after boiling it.

Milk may be a medium for transmitting several zoonotic diseases, including brucellosis, tuberculosis, salmonella, and others. Consuming unpasteurized dairy products may help prevent tuberculosis. Salmonella is spread by eating raw or undercooked meat, tainted eggs, or raw or unpasteurized dairy products. Also, many bacterial diseases are spread because of improper hand hygiene after contact with feces [24]. The current study found that there is full knowledge and information on the need to isolate sick cattle and not sell their milk, while 2% of breeders sell milk while giving the cattle the treatments.

Moreover, it was found that all breeders do not intend to have the animals examined periodically by a specialized veterinarian. It is shown that about 80% of breeders milking the cattle close to each other and do not tend to put a dedicated and cleaner place for milking. They also do not consider the cleaning of the udders of the cattle. Nearly 74% of the breeders use tools that are only washed with water when they collect milk. All breeders considered the need to keep the milk in cold places to store it, but there were some differences in where it was kept.

Dairy farms produce milk for human consumption more than anything else. For the milk to be safe for human consumption, even if improper milking techniques are not used, breeders must ensure clean milking environments. Bacteria and other microbes may multiply and spread in milk. Cleaning utensils are essential to clean milking practices because unclean utensils are prone to lower milk quality. A review of the presented data shows that the farm workers followed minimal practices regarding clean milk production practices, which is consistent with a previous study[25].

Keeping the quality of milk at a high standard requires tight quality control procedures at the dairy farm level at all phases of animal management, processing, and shipping of milk and dairy products. Factors like composition and cleanliness often determine milk quality. Four main factors need to be considered in a farm practice management plan: animal health, cleanliness of the milking process, use of clean equipment, and cleanliness of the milking area [22]. In general, it is considered that the lack of clean milk production can lead to the potential contamination of all milk products[26].

5. CONCLUSION

The study concluded that there is a low level of clean milk production practices in Basra Governorate. Not all breeders took into account that animals need to be checked regularly and that the level of some essential factors for making clean milk went down. These factors include keeping tools clean by using detergents, wearing clean clothes when milking, and milking livestock close to the animals. breeders about clean milking practices, and have the veterinary hospital visit the animals periodically to check on their health.

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