

Research Article

# Technical-Economic Study of the Agri-Food Investment Project “Big Milk Production Unit in Algeria- 4000 Dairy Cows”

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## Abstract

National milk production reached 3.52 billion liters in 2017, including more than 2.58 billion liters of cow's milk (73%), according to a report by the Ministry of Agriculture, Rural Development and Fisheries in Algeria. Due to the geographical location of the State of Biskra, its environmental diversity, its water resources, its flat lands and its human potential with its crops, the Zibans region has endowed its agricultural, pastoral and agri-food professions. According to statistics from the Directorate of Agricultural Services (DSA) of the Wilaya of Biskra (2019), milk production in the State of Biskra has seen a slight increase of 1% since 2016, reaching 44,783,000 liters, to reach 45,244,820 liters in 2019. Meeting the needs of milk consumers at the local, regional and national levels remains a challenge for the Ministry of Commerce and the Ministry of Agriculture. In this regard, the main objectives of the Bouchagroune Dairy are: participation in the development of the local social and economic sector (State of Biskra) by providing products that can contribute to meeting milk needs at the local level, creating jobs and increasing tax revenues to the public treasury. This technical-economic study has shown the feasibility of the project “Big Milk Production Unit in Algeria- 4000 Dairy Cows” that it will cover 100% of the local needs of the Biskra region, 50% of the regional needs and 20% of the national needs.

## Keywords

Algeria, Biskra, Agri Food, Milk Production, Technical Economic Study

## 1. Introduction

National milk production reached 3.52 billion liters in 2017, including more than 2.58 billion liters of cow's milk (73%), according to a press release from the Ministry of Agriculture, Rural Development and Fisheries [13].

"The cost of producing milk reached 179.71 billion dinars in 2017," the same source said. [13]

In this regard, the ministry reported 971,633 head of dairy cows, 17,709,588 sheep, 2,949,646 dairy goats and 207,884 camels. [8]

Regarding the ranking by wilaya, the wilaya of Sâïf tops the list with a production of 287,325,000 liters in 2017 followed by Tizi Ouzou (178,785,000 liters) and Sidi Bel Ab-

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bes (167,178,000). [12]

The geographical location of the wilaya of Biskra, its ecological diversity, its water resources, its flat lands and its human potential with their crops have given the Zibans region its agro-pastoral and agro-food vocation. [1, 6]

According to statistics from the DSA Biskra (2019), milk production in the wilaya of Biskra has seen a slight increase of 1%, since 2016 when it was 44,783,000 liters to reach 45,244,820 liters in 2019. [14]

Goat and sheep milk production represent the majority of production, they reached 18,283,240 liters, 16,213,500 liters respectively in 2019, [11] followed by bovine milk production with 8,471,580 liters and then camel milk production with 2 276,500 liters during the same year (2019). [9]

To this end, the main objectives of dairy Bouchagroune are:

1. Participation in the development of the local socio-economic sector (wilaya of Biskra).
2. Participation in the availability of dairy products and its derivatives in the local and national market.
3. Creation of new permanent & fixed-term employment positions for young unemployed people (34 employment positions planned).
4. Contributions to increasing tax revenues for the public treasury.

## 2. Results and Discussion

### 2.1. Current Situation (Dairies in the Wilaya of Biskra)

a) Biskra Milk (SARL):

Address: The industrial zone.

Municipality / Wilaya of registration: Biskra / Biskra.

This unit is the first processing unit in the wilaya of Biskra. It started its activity in 2004. Its current production capacity is 19,000 liters/day. [2]

b) Amira Milk (EURL):

Address: Cite Rais Ahmed.

Municipality / Wilaya of registration: Ourelal / Biskra.

This processing unit started its activity in 2005, considered the most productive dairy in the Biskra region, it presents various dairy products, its current production capacity is 20,000 liters/day. [3]

c) Djemina Lait (SNC):

Address: El Harmliia South.

Municipality / Wilaya of registration: Zeribet El Oued / Biskra. [4]

This processing unit started its activity in 2016; the state has not yet supported it with milk powder. Its products are entirely based on raw milk only; its current production capacity is 1600 liters/day. [7]

d) Dairy production in the Wilaya of Biskra:

According to statistics from the DSA Biskra (2019), milk

production in the wilaya of Biskra has seen a slight increase of 1%, since 2016 [14] when it was 44,783,000 L liters to reach 45,244,820 liters in 2019. [5]

Goat and sheep milk production represent the majority of production, they reached 18,283,240 liters, 16,213,500 liters respectively in 2019, followed by bovine milk production with 8,471,580 liters [14] and then camel milk production with 2 276,500 liters during the same year (2019). [10]

### 2.2. General Information About the Project

Appointment: Biskra Dairy

Nature of the project: Agri-food investment

Legal form: Legal entity

Proposed headquarters: Activities area – national road No. 46 – Commune of Bouchagroune – Daira de Tolga – Wilaya of Biskra

Overall cost of the project: 2000000000.00 DA

Financial resources:

Self-financing 30% i.e.: 600000000.00 DA

National Bank of Algeria 70% i.e.: 1400000000.00 DA

Source of raw products (Raw milk): Biskra cattle farm

Potential customers: Consumers from the local and national market

### 2.3. Location of the Project

Project address: Activities area – national road No. 46 – Commune of Bouchagroune – Daira de Tolga – Wilaya of Biskra

Area: 130051.36 m<sup>2</sup> (13 hectares)

Perimeter: 1439.89 m

Borders:

1. North: Mountainous area
2. South: National road no. 46
3. East: Mountainous area
4. West: Mountainous area

Geographic coordinates:

N 34° 44' 22" E 5° 26' 44" Altitude: 161 m

The Biskra dairy is located near national road No. 46, which is a strategic and important location, which allows it to provide good and free advertising. In addition to the availability of all living and working conditions: water, electricity, gas, easy access to the dairy.



Figure 1. Geographical location of Laiterie de Biskra.

## 2.4. Investment Objectives

1. Participation in the development of the local and national socio-economic sector.
2. Participation in the availability of dairy products and its derivatives in the local market (wilaya of Biskra 100%) and (National 20%).
3. Creation of new permanent & fixed-term employment positions for young unemployed people (250 employment positions planned).
4. Contributions to increasing tax revenues for the public treasury.
5. Participation in the preservation and protection of the environment.

## 2.5. Economic and Social Impact of the Project

1. Contribute to covering the demand for milk in the wilaya of Biskra and nationally.
2. Helping to increase tax revenue for the public treasury.
3. Creation of jobs (CDI-CDD).

## 3. Experimental

### 3.1. Features of the Current Offer

According to statistics from the DSA Biskra (2019), milk production in the wilaya of Biskra has seen a slight increase of 1%, since 2016 when it was 44,783,000 L liters to reach 45,244,820 liters in 2019.

Goat and sheep milk production represent the majority of production, they reached 18,283,240 liters, 16,213,500 liters respectively in 2019, followed by bovine milk production with 8,471,580 liters and then camel milk production with 2 276,500 liters during the same year (2019).

The supply is currently insufficient in terms of dairy products and its derivatives in the wilaya of Biskra. There are only three dairies in the wilaya of Biskra:

a) Biskra Milk (SARL):

This unit is the first processing unit in the Biskra willaya. It started its activity in 2004. Its current production capacity is 19,000 liters/day.

b) Amira Milk (EURL)

This processing unit started its activity in 2005, considered the most productive dairy in the Biskra region, it presents various dairy products, its current production capacity is 20,000 liters/day.

c) Djemina Milk (SNC)

This processing unit started its activity in 2016, the state has not yet supported it with milk powder. Its products are entirely based on raw milk only; its current production capacity is 1600 liters/day.

## 3.2. Features of the Offer in the Future

The Biskra Dairy will meet the needs of local consumers with reasonable prices for dairy products and its derivatives:

Dairy products:	Dairy derivatives
2024: 50000 liter / day	2027: 10000 tons /year
2025: 100000 liter / day	2028: 20000 tons /year
2026: 150000 liter / day	2029: 30000 tons /year
2027: 200000 liter / day	2030: 40000 tons /year
2028: 250000 liter / day	
2029: 300000 liter / day	
2030: 350000 liter / day	

### 3.2.1. Human Resources

1. Director
2. Commercial director
3. Technical director
4. General secretary
5. Executive secretary (02)
6. Human Resources Manager
7. Accounting manager
8. Responsible for general resources
9. Quality Manager
10. Health, safety and environment manager
11. Internal security manager
12. Accountant (02)
13. Administrative staff (30)
14. Cashier (05)
15. Storekeeper (05)
16. Food engineer (02)
17. Quality control engineer (01)
18. Quality control technician (05)
19. Industrial chain operator (100)
20. Maintenance operator (10)
21. Driver (30)
22. HSE Guardians (20)
23. Housekeeper

### 3.2.2. Operating Equipment

1. Storage store for raw products (raw milk)
2. Quality control laboratory
3. Milk production lines
4. Pasteurization lines
5. Freezing and cooling rooms
6. Storage stores
7. Marketing stores
8. Refrigerated trucks for transporting raw products (raw milk)
9. Refrigerated trucks for distribution of dairy products and derivatives

## 10. Service vehicles.



**Figure 2.** Milk processing equipment (Original).



**Figure 3.** Quality control laboratory.



**Figure 4.** Pasteurisation line.

## 3.2.3. Milk Products and Derivatives



**Figure 5.** Biskra Dairy Product (Pasteurized Milk).



**Figure 6.** Biskra Dairy Product (cow's milk and cheese).



**Figure 7.** Biskra Dairy Product (Sorbet, butter, yogurt).



**Figure 8.** Transport of dairy products.



**Figure 9.** Transport of dairy product derivatives.

### 3.3. Investment Development Plan in 05 Years

*Table 1. Investment Development Plan in 05 Years.*

Operation	2023	2024	2025	2026	2027
Fitting out and equipping the dairy	x				
Sale of pasteurised cow's milk		x			
Sale of cow's milk pasteurized (Biskra)			x		
Sale of pasteurized cow's milk (National)				x	
Sale (sorbet, butter, yogurt, cheese) (Biskra)					x
Sale (sorbet, butter, yogurt, cheese) (National)					x

### 3.4. Provisional Investment Expenses (2023 - 2028)

*Table 2. Provisional Investment Expenses (2023 - 2028).*

Designation	Number	Amount HT (DA)
Working capital	01	100000000.00
Total layout of the dairy	01	1000000000.00
Milk production line	01	100000000.00
Laboratory equipment	01	50000000.00
Solar energy	01	50000000.00
Hydraulic drilling and network	01	50000000.00
Refrigerator Truck (raw milk transport)	20	200000000.00
Refrigerator Truck (transport milk and derivatives)	20	200000000.00
Service vehicles	10	50000000.00
Cold storage	10	5000000.00
Paying workers	250	1000000000.00
Taxes and insurance (each year)	5 years	100000000.00
Unplanned charges	5 years	100000000.00
	Total (Ht)	3100000000.00

The investment costs for the period (2023-2028) are estimated at: (3100000000.00 DA excluding tax).

### 3.5. Overall Investment Revenues (2023-2028)

2023: year of construction and equipment:

**Table 3.** Overall Investment Revenues in 2023.

Designation	Quantity tons / liter / bag	Amount excluding tax (DA)
Sale of pasteurized cow's milk	/	/
Sale (Sorbet, butter, yogurt, cheese, Sorbet, butter, yogurt, cheese)	/	/
Total		0

2024: 1st year of start of production:

**Table 4.** Overall Investment Revenues in 2024.

Désignation	Quantité en / litre / sachet	Montant HT (DA)
Vente lait de vache pasteurisé	50000	780000000.00
Vente (Sorbet, beurre, yaourt, fromage, Sorbet, beurre, yaourt, fromage)	/	/

2025: 2nd year of start of production:

**Table 5.** Overall Investment Revenues in 2025.

Designation	Quantity tons / liter / bag	Amount excluding tax (DA)
Sale of pasteurized cow's milk	100000	1560000000.00
Sale (Sorbet, butter, yogurt, cheese, Sorbet, butter, yogurt, cheese)	/	/
Total		1560000000.00

2026: 3rd year of start of production:

**Table 6.** Overall Investment Revenues in 2026.

Designation	Quantity tons / liter / bag	Amount excluding tax (DA)
Sale of pasteurized cow's milk	150000	2340000000.00
Sale (Sorbet, butter, yogurt, cheese, Sorbet, butter, yogurt, cheese)	/	/
Total		2340000000.00

2027: 4th year of start of production:

**Table 7.** Overall Investment Revenues in 2027.

Designation	Quantity tons / liter / bag	Amount excluding tax (DA)
Sale of pasteurized cow's milk	200000	3120000000.00
Sale (Sorbet, butter, yogurt, cheese, Sorbet, butter, yogurt, cheese)	100000	50000000.00
Total		3170000000.000

2028: 5th year of production start-up:

**Table 8.** Overall Investment Revenues in 2028.

Designation	Quantity tons / liter / bag	Amount excluding tax (DA)
Sale of pasteurized cow's milk	2500000	3900000000.00
Sale (Sorbet, butter, yogurt, cheese, Sorbet, butter, yogurt, cheese)	200000	10000000.00
Total		4000000000.00

The overall investment revenue for the period (2023-2028) is estimated at (11850000000.00 DA excluding tax).

### 3.6. Statistical Assessment

Overall revenue (2023-2028): 11850000000.00 DA excluding tax

Overall charge (2023-2028): 3100000000.00 DA excluding tax

Net gain (2023-2028): 11850000000.00 DA - 3100000000.00 DA

Net gain (2023-2028) = 8750000000.00 DA excluding tax.

## 4. Conclusion and Discussion

The technical-economic analysis of this project shows us that:

1. This project contributes 100% to the development of the local and national socio-economic sector.
2. This project contributes to the availability of dairy products and its derivatives in the local (100%) and national (20%) market.
3. This project contributes to the creation of permanent and fixed-term employment positions for young unemployed people (250 employment positions planned).
4. This project contributes to increasing tax revenue for the public treasury.
5. The Biskra dairy is located near national road No. 46, which is a strategic and important place, which allows

it to provide good and free advertising.

6. This project contributes to the preservation and protection of the environment.

## Abbreviations

DSA	Directorate of Agricultural Services
SARL	Limited Liability Company
EURL	Single-person Limited Liability Company
SNC	The General Partnership

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## Conflicts of Interest

The authors declare no conflicts of interest.

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