

1



2

Small Ruminant population: a Rural Community in need of support

- Mostly pastoral communities
- Both sheep and goats are managed under nomadic and semi-nomadic systems, feeding on natural grasslands, crop remnants, and forest types
- Sheep and goats have always been an integral part of the rural mosaic in Lebanon



Baladi goat grazing in natural rangelands

3

Cattle in Numbers

Governerate	Cattle	Sheep	Goats
Baalbeck-Hermel	27,068	142,962	59,472
Bekaa	18,525	133,986	85,767
Akkar	16,571	28,792	18,906
North Lebanon	8,415	47,927	42,943
Total	70,579	353,667	207,088

- Small ruminants in Lebanon contribute to 25% of milk production (in fresh milk equivalent).
- Producers usually sell the largest part of milk to manufacturers as whole milk or artisanal transformation.
 - 87.6% of goat milk
 - 92.4% sheep milk sold
- The goat milk sector in Lebanon is in continuous development, especially with new enterprises and imported breeds.

4

Brucellosis

Brucella bacteria survive intracellularly in macrophages, causing chronic infection

- Brucellosis is a **zoonotic bacterial disease**
 - *Brucella melitensis* → sheep/goats (most important in Lebanon)
 - *Brucella abortus* → cattle
- **Animal-to-Animal Transmission**
 - Aborted fetuses
 - Placenta
 - Vaginal secretions
 - Contaminated feed/water
- **Animal-to-Human Transmission**
 - Unpasteurized dairy products
 - Direct animal contact
 - Occupational exposure
 - Aerosol exposure in farms/labs
 - Skin wounds during handling



5

Brucellosis in Lebanon

- Persistent endemic brucellosis
 - Traditional farming systems
 - Informal livestock movement
 - Limited vaccination/control programs
- Consumption of raw products
 - Raw milk and homemade cheeses
 - Baladi Cheese (made from non pasteurized milk)
 - Meat
- Higher prevalence in:
 - Rural pastoral communities
- Seasonal peaks:
 - Lambing/calving seasons

6

Prevalence in Lebanon

CAPRIN + OVINE	HERD SIZE	SAMPLES	POSITIVE	% POSITIVE / AREA	% POSITIVE AREA / TOTAL POSITIVE AREA	% POSITIVE AREA / TOTAL SAMPLES
TERBOL+DALHAMIAH+FAOUR	3450	133	62	46.6%	48.1%	18.9%
KFARZABAD+DEIR AL GHAZAL	1190	60	17	28.3%	13.2%	5.2%
KAB ELIAS+AMMIK	1930	73	26	35.6%	20.2%	7.9%
DOUHOUR ZAHLE+KAA EL RIM	1980	62	24	38.7%	18.6%	7.3%
TOTAL	8550	328	129	37.3%	100.0%	9.8%

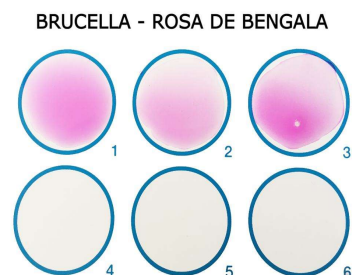
LARI, 2019

CAPRINE + OVINE	HERD SIZE	SAMPLES	POSITIVE	% POSITIVE
TERBOL - LARI STATION	200	43	2	4.7%

7

Testing

- **In Animals**
 - Common tests:
 - Rose Bengal Test
 - ELISA
 - Complement fixation test
 - PCR (advanced labs)
- **In Humans**
 - Blood cultures
 - Serology
- **Challenges in Lebanon**
 - Inconsistent surveillance
 - Limited nationwide screening
 - Cost barriers



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8

Prevention and Control Strategies

- **In Animals**
 - Vaccination programs
 - Rev.1 vaccine for sheep/goats
 - S19/RB51 for cattle
 - Test-and-slaughter policies
 - Biosecurity measures
 - Proper disposal of aborted materials
- **In Humans**
 - Pasteurization
 - PPE for animal workers
 - Public awareness campaigns

One Health Approach

A "One Health" strategy is critical because brucellosis links animal, human, and environmental health.

- Veterinarians
- Physicians
- Public health authorities
- Farmers

9

Vaccination

- **Mostly the Rev.1 vaccine**
- **Seropositivity reached**
 - 34 % Bekaa
 - 24 % Kesrwan
 - 21 % Chouf
 - 19 % South Lebanon
- **Outbreak**
 - Human incidence 3.9 per 100,000
 - 2009 Chouf outbreak
 - 54.3 per 100,000
 - Cattle 10 % Bekaa
 - 33 % Nationwide

10

Challenges & Needs in Lebanon

- **Main Challenges**
 - Economic instability
 - Incomplete national coverage
 - Weak enforcement of livestock regulations
 - Cross-border animal movement
 - Cultural preference for raw dairy products
- **Future Needs**
 - Stronger surveillance systems
 - Nationwide vaccination
 - Regional cooperation
 - Public education
 - Research funding



11

Management areas for improvement

- Lack of traceability
- Lack of record keeping
- Lack of extension and veterinary support
- Feed supplementation for improved yield (kidding)
- Long travel distances depending on area
- Heat stress

12



Baladi goats in Make Shift confinement

13

CIHEAM ZARAGOZA | Food and Agriculture Organization of the United Nations

International Seminar
**Mediterranean Livestock Systems:
Challenges and Pathways
for Sustainability**
Madrid, Spain • 7-8 April 2026

In collaboration with:

Innovation in Small Ruminant Farming in Lebanon

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14

Symptoms and Economic Consequences

- **Symptoms in Animals**
 - Abortions
 - Infertility
 - Reduced milk production
 - Weak offspring
- **Symptoms in Humans**
 - Undulating fever
 - Fatigue
 - Joint pain
 - Chronic complications
- **Economic Consequences**
 - Reduced reproductive performance
 - Livestock losses
 - Decreased milk production
 - Trade restrictions
- **Public Health Burden**
 - Chronic debilitating disease in humans
 - Long treatment duration
 - Antibiotic costs
 - Underreporting problems