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Characterization of goat milk industry in the North and Oases region of Morocco

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I. INTRODUCTION:

Estimated goat herd population is 5.5 millions and goat milk production is about 46 millions of liters which represents 5% of the national dairy in Morocco.

This production is mainly used in rural self consumption. Added value through cheese making is very limited and it is a women job.

In addition, goat milk processing faces many constraints such as the low valorization of the milk production (0.5 kg of cheese /year/person), the non respect of the hygienic practices during milking, the loss of the traditional know-how...

Nevertheless this activity can contribute significantly to household revenue and offer a good opportunity to improve both the profitability and the development of goat husbandry.

For all these reasons and others, the Moroccan Collaborative Grant Pro-gram project (MCGP) in its component 'Improving income of farmers in southern Morocco' aims to support operators in the dairy goat breeding, by expertise, to increase milk production, to diversify it, to better control it, increase profitability and improve farmers income in north and south parts of Morocco. This modest work provides a plate-form related to the characterization of goat dairy sector in both regions.

II. MAIN OBJECTIF:

Characterize the local knowledge (KNOW-HOW) in north and south regions of Morocco.

III. METHODOLOGY:

To meet the above objectives, field excursions were conducted in specific areas of North & South MOROCCO with the aim of characterizing the local expertise in milk processing and manufacture of goat cheese, and collect samples of milk and cheese for physical-chemical and microbiological analysis.

Initially, the work was focused on the establishment of surveys for cheese operators of the regions. These surveys were subsequently completed by our participation in sessions of cheese production.

A sampling schedule (of goat milk & cheese) was adopted during the characterization of local expertise.

- **Period of study & Target Areas:** 2 years (2008 & 2009):

| | |
|--------------|---|
| NORTH | The provinces of Tangier, Tetouan, Larache, Ksar Kbir and Chefchaouen in collaboration with 53 farmers. |
| SOUTH | The provinces of Errachidia, Ouarzazate, Skoura, Ighrem N'ougdal in collaboration with more than 100 farmers. |

- **Physical & chemical analyses of milk and cheese:**

The physical and chemical analysis have concerned: the pH, titrimetric acidity, density, dry matters (DM), ashes, fat content (FC), lactose, and total nitrogen content (TN) (AFNOR, 1993).

- **Microbiological analyses of milk and cheese:**

Enumeration of 7 microbiological groups according to the international standards (IDF, 1997). Micro-organisms determined were: Total Mesophilic Flora (TMF), total and fecal coliforms (TC and FC), Yeasts, Molds, Psychrotrophic Bacteria (PB) and lactobacillus bacteria.

- **Sampling of milk & cheese:**

During 12 months with about 65 samples.

IV. RESULTS & DISCUSSION:

With 40 cheese factories, only 7 were professionals (4 in the North and 3 in the South). The survey in both regions had revealed the following remarks:

- Transformation of milk is oriented mainly toward the production of fresh cheese (perspectives of development of the semi-cured flavored cheese), and is characterized by a big variation between dairies;

- Total absence of quality control during different stages of fabrication;

- Production is irregular, and is higher during spring period and beginning of summer;

- The weekly transformed quantity of milk is about 700 liters in the north and between 400 to 650 liters in the South;

- The goat milk is often mixed with cow milk to elaborate fresh cheese (especially in the North);

- The utilization of commercial rennet is common in dairies in both regions with different quantities;

- The cooperatives generally limit their equipment and production to traditional utensils (pots, filters and moulds servants, glassware...). This, don't eliminate the existence of material appropriate to the dairy use and to the cheese production;

- 5 categories of processes depending on modalities of coagulation were identified in the North & 1 in the South;

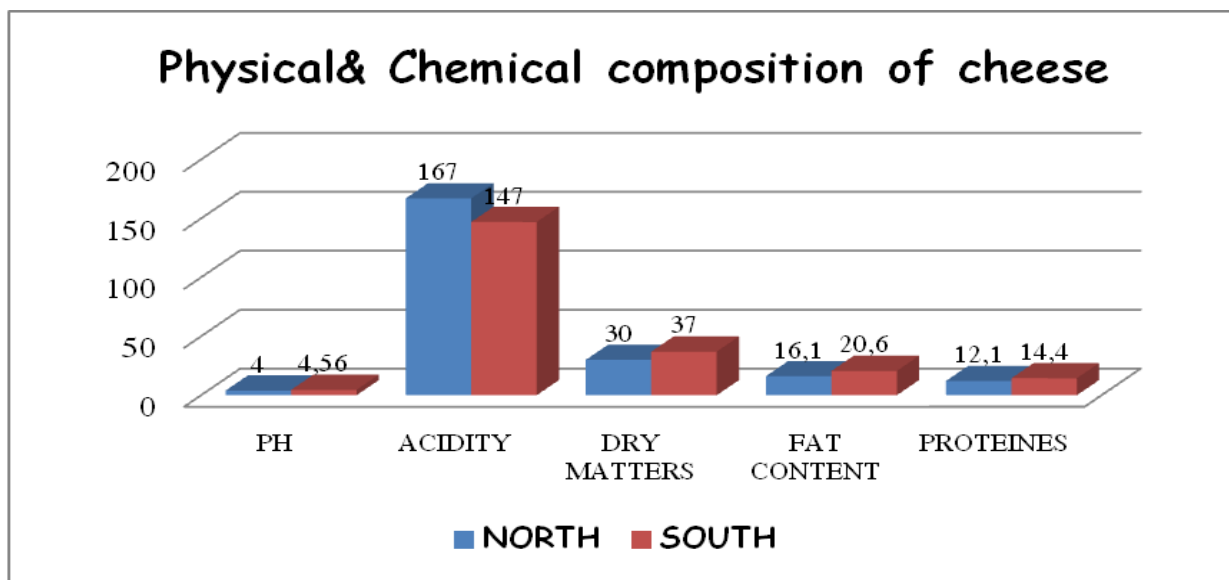
- The major steps are: reception, filtration, thermization or pasteurization, coagulation (commercial rennet), molding & draining, salting and conditioning;

- Commercialization of cheese (generally) in a non refrigerated vehicles; some customers buy there; the price is about 80 MDH (8 Euros) per kilogram;

- Micro-organisms indicating low level of hygiene were high (The count of total, coliforms, yeasts and molds which are about 2,66 Log₁₀ cfu /g, 2.6 Log₁₀ cfu /g and 4.88 Log₁₀ cfu /g respectively remain in the same range of the values noted by the authors) and several cheeses failed the standards laid down by the Moroccan legislation...

- Milk & cheese characterization is reported in the tables below:

| <u>Milk</u> | pH | Acidity (°D) | Density (kg/l) | Dry Matters (%) | Ashes (%) | Fat Content (g/l) | NT (g/l) | Lactose (g/l) |
|--------------|-----------|-------------------------|---------------------------|--------------------------------|----------------------|----------------------------------|---------------------|--------------------------|
| North | 6,60 | 2,70 | 1,040 | 13,38 | 0,67 | 35,8 | 36,7 | 39,8 |
| South | 6,53 | 1,56 | 1,029 | 12,31 | 0,71 | 36,8 | 31,9 | 47,6 |



- The obtained values of physical & chemical characteristics of goat milk & cheese in both regions were relatively similar, with minim-superiority of dairy products in the oases region;

- Cheese yield is about 19% in the North and 18.5% in the South.

V. Conclusion:

Taking account of the gotten results, the chemical composition of milk in the 2 regions seems to assure a better cheese production (quality & quantity), if the process of manufacture will be well mastered in it different steps.

In addition, Training sessions will be organized for goat cheese producers in both regions in order to make level knowledge on cheese processing.