



# PROCAMED

*“Promotion des systèmes camélins innovants et des filières locales pour une gestion durable des territoires sahariens”*

## Training Course in Dromedary Camel Reproduction

8-9-10 December 2015, Institut des Régions Arides (IRA) Médenine, Tunisia

Organization:

- Prof. Lacalandra G.M.** (University of Bari Aldo Moro, Italy)
- Prof. Khorchani T.** (Institut des Régions Arides, Tunisia)
- Prof. Hammadi M.** (Institut des Régions Arides, Tunisia)
- Dr. Monaco D.** (University of Bari Aldo Moro, Italy)

A training course on dromedary camel reproduction has been organized in Tunisia within the action 2.1. “Amélioration de la productivité numérique par l’introduction de biotechnologie de la reproduction”

The objective of the course was to present the innovations introduced in the management of reproduction of dromedary camel and to transfer the knowledge acquired during the project about assisted reproductive technologies (ART’s) in the dromedary camel species.

11 attendants which belonged to the following institution participated to the project:

- Commissariat Régionaux au Développement Agricole (CRDA) Tozeur, TUNISIA
- Commissariat Régionaux au Développement Agricole (CRDA) Gabes, TUNISIA
- Commissariat Régionaux au Développement Agricole (CRDA) Medenine, TUNISIA
- Office de l’Elevage et des Paturages (OEP) Tataouine, TUNISIA
- Office de l’Elevage et des Paturages (OEP) Medenine, TUNISIA
- Office de l’Elevage et des Paturages (OEP) Gabes, TUNISIA
- Department of Veterinary Service MAURITANIA
- Ministere d’Elevage MAURITANIA
- Desert Research Center (DRC) (2 Attendants) EGYPT
- Institut Des Régions Arides, Medenine, (2 Attendants) TUNISIA

Nom & Prénoms	التسمية	المنظمة	التوقيع
01	Dr. Lacalandra G.M.	UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO	[Signature]
02	Prof. Khorchani T.	INSTITUT DES RÉGIONS ARIDES	[Signature]
03	Prof. Hammadi M.	INSTITUT DES RÉGIONS ARIDES	[Signature]
04	Dr. Monaco D.	UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO	[Signature]
05	Commissariat Régionaux au Développement Agricole	CRDA	[Signature]
06	Office de l’Elevage et des Paturages	OEP	[Signature]
07	Office de l’Elevage et des Paturages	OEP	[Signature]
08	Office de l’Elevage et des Paturages	OEP	[Signature]
09	Department of Veterinary Service	MAURITANIA	[Signature]
10	Ministere d’Elevage	MAURITANIA	[Signature]
11	Desert Research Center (DRC)	EGYPT	[Signature]
12	Institut Des Régions Arides, Medenine	TUNISIA	[Signature]
13	Institut Des Régions Arides, Medenine	TUNISIA	[Signature]
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03	Prof. Hammadi M.	INSTITUT DES RÉGIONS ARIDES	[Signature]
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11	Desert Research Center (DRC)	EGYPT	[Signature]
12	Institut Des Régions Arides, Medenine	TUNISIA	[Signature]

**PROGRAM:** The training was composed of 11 hours of theoretical lectures and 6 hours of practical demonstrations.

## **THEORETICAL PART**

**Prof. T. Khorchani** (*Institut des Régions Arides (IRA), Tunisia*): **Presentation of the PROCAMED**

**Prof. G.M. Lacalandra** (*University of Bari Aldo Moro, Italy*): **Presentation of the training course**

**Prof. M. Hammadi** (*Institut des Régions Arides (IRA), Tunisia*):

### **Reproductive Physiology of the Female Camel (1.5 h)**

Seasonality and other generalities on female camels

Estrus behavior and related aspects

Ovarian follicular waves theory, the induction of ovulation and corpus luteum development

Physiological basis for pregnancy diagnosis through progesterone determination.

**Dr. M. Fatnassi** (*Institut des Régions Arides (IRA), Tunisia*):

### **Reproductive Physiology of the Male Camel (1.5 h)**

Male dromedary camel seasonality, estrus signs, factors affecting the reproductive performance

Aspects related with management of bulls and techniques for evaluating and improving the male camel libido.

**Dr. B. Padalino** (*University of Bari Aldo Moro, Italy*)

### **Male Camel Welfare, Management and Training for Semen Collection (1.5 h)**

Importance of animal welfare

Animal welfare criteria

Relation between animal welfare, productions and reproduction

Management techniques for camels bulls reared for semen collection

Animal learning theory and its application for male camel's training to semen collection.

**Dr. K.A. El. Baharawy** (*Desert Research Center, DRC, Alexandria, Egypt*)

### **Dromedary Camel Semen Collection And Evaluation (2 h)**

Aspects about Assisted Reproductive Technologies in dromedary camels

Semen collection from dromedary camel bulls (Electroejaculation, Artificial Vagina, Camel Dummy).

Technical information about handling and evaluation of semen (Viscosity reduction, evaluation of motility viability, morphology, concentration, acrosome reaction).

**Dr. K.A. El. Baharawy** (*Desert Research Center, DRC, Alexandria, Egypt*)

### **Dromedary Camel Semen Cooling and Freezing (1 h)**

Semen extenders and their mechanism of actions.

Techniques for short term semen preservation (4° C)

Freezing and thawing process.

**Dr. M.M. Seddik** (*Institut des Régions Arides (IRA) Médenine, Tunisia*)

### **Female Camel Synchronization and Artificial Insemination (1.5 h)**

Advantage of synchronizing female camels

Protocols for synchronizing the ovarian activity

Monitoring of synchronization protocol efficacy by hormonal analysis

Artificial insemination in dromedary camels.

*Dr. D. Monaco (University of Bari Aldo Moro, Italy)*

### **Female Camel Ultrasonography (1.5 h)**

Principles of ultrasonography, artefacts in ultrasonography and criteria for choosing an ultrasound device.  
Female camel restraining and gynecological examination (manual and ultrasonographical evaluation).  
Ultrasonographic appearance of follicles during the different ovarian follicular phases.  
Appearance of the corpus luteum and pregnancy diagnosis.  
Principles and techniques for determining the fetal sex.

### **PRACTICAL DEMONSTRATIONS:**

*M. Fatnassi, B. Padalino, B. Kchira*

#### **Semen Collection**

Visual and olfactory contact between male and female  
Preparation of equipment and materials for the semen collection,  
Semen collection and Male libido Evaluation

*M. Fatnassi, K.A. El. Baharawy, D. Monaco*

#### **Semen Evaluation and Processing**

Macroscopic and Microscopic evaluation of the semen  
Evaluation of concentration and motility  
Semen Dilution  
Semen Freezing  
Thawing and evaluation

*D. Monaco, M.M. Seddik*

#### **Gynecological examination of female camel, Ultrasonography, Artificial Insemination**

Equipment preparation and restraining technique,  
Gynecological examination  
Rectal palpation and ultrasound evaluation of the ovaries  
Technique of artificial insemination

B.Faye

#### **Closure Of The Training, Recommendation, Evaluation Questionary**

### **OUTPUTS**

Attendants participated with great interest and enthusiasm; several questions were asked during the theoretical part, thus testifying the interest for the topic. There was an active exchange of opinion and technical information, regarding physiology of reproduction and related practical aspects. During practical demonstration several important key aspects were explained about reproduction and Assisted Reproductive Technologies of this species and the participants were actively involved in the demonstration.

At the end of the course attendants were asked to fill an evaluation sheet (see annex): the analysis of the latter revealed that the course was greatly appreciated about its organization of time and lectures, but it also emerged that one day of practical part was insufficient considering the particular reproductive physiology of this species and the specific skills to be acquired. A CD Rom containing all the lectures was provided to all participants.

## PICTURES



**Prof. Khorchani and Prof. Hammadi welcome and introduction of the PROCAMED project**



**Prof. Lacalandra introduced the training course**



**Dr. Fatnassi introduced her lecture about male camel**



**Dr. El Bahrawy starts his presentation**



**Dr. Seddik showing identification of animals through intraruminal bolus**



**Mr. Habib and Mr. Belgacem prepared animals and materials for the semen collection**



**“practical” demonstration of semen collection**



**Motility Analysis of dromedary camel sperms**



**Dr. El-Bahrawy describing the process of semen freezing**



**Dr. Seddik explaining how to perform the Artificial Insemination**



**Prof. Lacalandra and Prof. Hammadi**



**Group picture**



**Dr. Faye ready for the training evaluation and recommendation**



**A camel provides its greetings to dr. Monaco**



**End of the day at the IRA camel herd and end of the training course**

## **Conclusive remarks (B. Faye)**

The reproduction is the main motor of PROCAMED project because it was at the origin of the proposal and it is the main challenge for improving the camel herd productivity. Unfortunately this training is organized at the end of the project. However, it should be useful to list the innovations proposed in this matter and finally, according to the numerous available publications, to publish a book even if it occurs after the end of the project. The summary is already available.

Obviously, the techniques for improving the camel reproduction were well studied and well controlled nowadays thanks to the project, but the question of the use and of the diffusion of these innovations is the main challenge for the future. The question of the organization to be achieved for a better diffusion of the artificial insemination for example, must be debated. The biotechnologies of reproduction have to go out of the research stations and to reach the farmers. The question of the future development of the biotechnologies for camel reproduction could be the nucleus for a new project.

Annexe;

## **Evaluation of the session by the participants**

Regarding the content, each day was assessed and an average of 4.5/5 (between very good and excellent) was given to day1 and day2, then 4.6/5 for day 3 (practical training). The global evaluation of the content was 4.0/5 (very good). The balance between theoretical and practical was noted also 4.0 (very good). The organization of the session was well noted 4.4 –between very good and excellent and the total appreciation was not 4.5/5 on average. As the whole, 17 persons have fulfilled the evaluation sheet and considered the session as very useful. Only 3 persons expected a longer session and 2, expected more practical techniques.