



FAO-CIHEAM Network on Sheep and Goats  
Sub-Network on Production Systems

8th International Seminar

*Technology creation and transfer in small ruminants:  
roles of research, development services and farmer  
associations*

Tangier, Morocco, 11 to 13 June 2013



# PROGRAMME



الغرفة الفلاحية لجهة طنجة - تطوان



# Programme

## 11 June

08:30 - 09:15 Registration

09:15 - 09:45 Opening ceremony

**09:45 - 13:00 Session 1. Evolution and efficacy of technologies in sheep and goat production systems**

*Chairperson: F. Pacheco, DRAP-Norte, Portugal*

**Invited conferences**

09:45 - 10:15 Evolution and efficacy of technologies in sheep production systems in North Africa. M. Bengoumi. *FAO-SNE, Tunisia*

10:15 - 10:45 Research development in goat production in the North of Morocco. M. Chentouf. *INRA Tanger, Morocco*

*10:45 - 11:15 Poster viewing and coffee break*

**Oral presentations**

11:15 - 11:30 Proposal of complementary indicators in reproduction and selection to evaluate sheep and goat production systems. G. Toussaint, *P. Morand-Fehr, J.M. Castel-Genis, M. Chentouf, Y. Mena, F. Pacheco, A. Ruiz, G. Srour. FAO-CIHEAM Network on Sheep and Goats*

11:30 - 11:45 Evolution and efficacy of use of indicators for improving goat pastoral farms. *Y. Mena, F.A. Ruiz, J.M. Castel, R. Gutiérrez, G. Toussaint. FAO-CIHEAM Network on Sheep and Goats*

11:45 - 12:00 Feeding strategy of sheep in low rainfall areas. A. Chriyaa. *INRA, Settat, Morocco*

12:00 - 12:15 Artificial insemination in Moroccan sheep: the present and perspectives. B. El Amiri, *X. Druart, A. Fatet. INRA, Settat, Morocco*

12:15 - 12:30 Efficiency of ovine artificial insemination in Ouled Djellal breed. A. Allaoui, *B. Safsaf, I. Djaalab, W. Laghrour, S. Haffaf, M. Tlidjane. Univ. Batna, Algeria*

12:30 - 12:45 Effect of the incorporation of saponins sources (*Quillaja saponaria*, *Agave americana* and *Trigonella foenum-graecum* seeds) in the diet of Sicilo-Sarde ewes on the profile of fatty acids in milk. S. Nasri, *H. Ben Salem. INRAT, Tunis, Tunisia*

12:45 - 13:00 Genetic progress attained in the selection program of Florida breed of goats in Spain. *A. Menéndez-Buxadera, E. Muñoz-Mejías, J.M. Serradilla. Univ. Córdoba, Spain*

*13:00 - 14:00 Lunch*

14:00 - 14:15 Poster session 1

14:15 - 14:45 Discussion Session 1

**14.45 - 19.00 Session 2. Research in sheep and goats: structures, approach, investment and results obtained**

*Chairperson: M. Badraoui. INRA, Morocco*

**Invited conferences**

14:45 - 15:15 Challenges to generate adaptable technologies and to build up strategic alliances for small ruminants research in low input systems: case of Tunisia. M. Rekik, *H. Ben Salem. IRESA, Tunisia*

15:15 - 15:45 The research and development programmes in dairy sheep in the Basque Country. E. Ugarte. *Neiker, Vitoria-Gasteiz, Spain*

15:45 - 16:15 Agriculture Research from the perspective of a Multilateral Development Bank: the Case of African Development Bank. B. Boulanouar. *African Development Bank*

### Oral presentations

- 16:15 - 16:30 Livestock future in North Africa. How can scientific knowledge progress, technical innovation implementation and local empiric norms and practices be improved? *J. Chiche. IAV Hassan II, Rabat, Morocco*
- 16:30 - 16:45 Sheep breeding in the Moroccan mountains as a vehicle for economic development: Case of Azilal province. *M. Benbati, B. Benjelloun, L. Haounou, M. Laghmir, B. Boulanoar. INRA Tadla, Morocco*
- 16:45 - 17:15 *Poster viewing and coffee break*
- 17:15 - 17:30 New sheep and goat products: "Mantas" and sausages. An integrated project in co-promotion. *A. Teixeira, S. Rodrigues. ESA-Inst. Politéc. de Bragança, Portugal*
- 17:30 - 17:45 New feeding technology using cactus in sheep fattening: applications to small-scale farms of Rhamna region, Morocco. *M. Bendaou, M'B. Ait Omar. INRA, Rabat, Morocco*
- 17:45 - 18:00 Technology transfer in small ruminants. Case of Southern and Southern east oases of Morocco. *M. Ibnelbachyr, A. Chikhi, S. Zantar, E. Sekkour, A. Lberji, A. Dadouch. INRA, Errachidia, Morocco*
- 18:00 - 18:15 Situation actuelle et perspective de développement de l'élevage des petits ruminants dans la région Tanger Tétouan. *J. Jout and M.S. Laidouni, Dir. Reg. d'Agriculture de Tanger*
- 18:15 - 18:30 Poster session 2
- 18:30 - 19:00 Discussion Session 2
- 20:30 Social dinner

### 12 June

- 09.00 - 12.45 **Session 3. Technology transfer in sheep and goat production systems: models, tools and actors**  
*Chairperson: M. Bengoumi, FAO-SNE, Tunisia*
- Invited conferences**
- 09:00 - 09:30 Technology generation and transfer using the community approach in West Asia and North Africa. The ICARDA experience. *A. Nefzaoui, M. El Mourid, V. Alary. ICARDA North Africa, Tunisia*
- 09:30 - 10:00 To manage livestock farming system, which tools for which goals and which users? Examples from France. *M. Benoit, S. Ingrand. INRA, Clermont-Ferrand Theix, France*
- Oral presentations**
- 10:00 - 10:15 Traditional knowledge and change of livestock herding systems in pastoral areas: what future for the local products of Djelfa region? *A. Meguellati, M. Kanoun, M. Abdellali-Martini, J. Huguenin, M.L. Cherfaoui, A. Ouzzane, A Benmebarak, F. Maamri. INRA Algeria*
- 10:15 - 10:30 Promoting native sheep breeds by autonomous production, involvement of farmers' organization, research and market. *M. Djemali, S. Bedhiaf-Romdhani. INAT, INRAT, Tunisia*
- 10:30 - 11:00 *Poster viewing and coffee break*
- 11:30 - 11:45 Technical and economic characterisation of goat production systems in the north of Morocco using FAO-CIHEAM methodology. *B. Farahat Laroussi, M. Chentouf, G. Toussaint, A. Zayed. INRA, Tangier, Morocco*
- 11:45 - 12:00 National sheep and goat breeding program and breeder associations' collaboration systems of Turkey. *I. Daskiran, V. Ayhan. Min. Food. Agric. Livestock. of Turkey, Ankara*

- 12:00 - 12:15 The renewed interest for the dairy sheep breeding in Tunisia: Success of an experience in the region of Béja. *A. Brahmi, R. Khaldi, L. Rajhi, G. Khaldi. Ecole Sup. d'Agric. du Kef, Tunisia*
- 12:15 - 12:30 Implantation of STAR accelerated lambing system in extensive Merino breed farms. *V. Vicario, B. Pardo, C. Leal, R.A. Martín, F. Borjas, F.A. Arrebola. IFAPA, Hinojosa del Duque, Spain*
- 12:30 - 12:45 Co-constructing knowledge about relationship between rangeland feed and goat cheese characteristics. *M. Napoléone, E. Genevet, B. Martin, C. Agabriel, J.M. Vincent, S. Hulin. INRA SAD, UMR SELMET, Supagro, Montpellier, France*
- 12:45 - 13:00 Dissociative representations of goat farming by different actors of the argane forest area: lessons for the organization of a territorial development based on the complementarities of various activities. *J.-P. Dubeuf, A. Araba, F. Casabianca, S. Chatibi, N. Lacombe, Th. Linck, J.-M. Sorba. INRA, Corte, France*
- 13:15 - 13:30 Poster session 3
- 13:30 - 14:00 Discussion Session 3
- 14:00 - 15:00 *Lunch*
- 15.00 - 18.00 **Round table. The role of farmers associations in the adaptation, testing and transfer of technologies in sheep and goats**  
*Chairperson: D. Gabiña, IAMZ-CIHEAM, Spain*  
*Guest speakers:*  
*S. Fagouri, Union Maghrébine des Associations Ovines et Caprines (UMAOC) and Association Nationale Ovine et Caprine (ANOC), Morocco*  
*F. Pacheco, DRAP-Norte, Portugal*  
*J.M. Serradilla, Univ Cordoba, Spain*  
*M. Benoit, INRA, Clermont-Ferrand Theix, France*
- 18.00 **Conclusions and closing of the Seminar**

### 13 June

Full day field trip - Visit to Bellota experimental station (ANOC) and a cheese factory in the area of Chefchaouen

## POSTERS

### Session 1. Evolution and efficacy of technologies in sheep and goat production systems

- 1.1 Evaluation of the anthelmintic activity of *Acacia cyanophylla* Lindl against gastrointestinal nematodes of sheep: in vivo study Tunisia  
*H. Akkari, M.A. Darghouth, H. Ben Salem*
- 1.2 Value of fodder legumes: cases of Medics (*Medicago spp.*) Algeria  
*F. Alane, M. Laouar, H. Yalhlef, Al Abdelguerfi*
- 1.3 Factors affecting scrotal measurements and weight of Ouled Djellal rams in eastern and south-eastern Algeria Algeria  
*A. Allaoui, B. Safsaf, I. Djaalab, W. Laghrour, M. Tlidjane*
- 1.4 Effet de la supplémentation de chèvres alpines sur la production laitière Morocco  
*A. Asehraou, A. Bechchari*
- 1.5 Aspect nutritionnel de l'arbuste *Atriplex halimus* du Sud Algérien chez les petits ruminants Algeria  
*H. Arab, S. Mehennaoui and M.L. Haddi*
- 1.6 Effect of feeding condensed tannins in carob pulp, on production and quality of milk and meat from goat Morocco  
*M. Ayadi, A. Arakrak, A. Chriyaa, S. El Othmani, M. Chentouf, S. Zantar, A. Bouassab*
- 1.7 Use of microsatellite markers for parentage identification and inbreeding control in Sicilo-Sarde dairy sheep flocks Tunisia  
*S. Bedhiaf-Romdhani, I.Kaddach, A. Bedhiaf, M. Djemali*
- 1.8 Injection of Sarda genes in the Sicilo-Sarde population by intrauterine AI using frozen semen Tunisia  
*S. Bedhiaf-Romdhani, M. Djemali*
- 1.9 La race synthétique ovine Deroua, un potentiel considerable d'enrichissement du cheptel ovin marocain Morocco  
*B. Benjelloun, M. Benbati, M. Laghmir, L. Haounu, A. Chikhi*
- 1.10 Growth performance of lambs D'man sheep in the experimental INRAA Adrar, southwest Algeria Algeria  
*A. Boubekour, M.T. Benyoucef, M. Lounassi*
- 1.11 The use of blood biochemical parameters in Ouled Djellal ewes as a tool to monitor their metabolic status during lactation and dry period Algeria  
*A. Boudebza, M.C. Abdeldjelil, A. Bensegueni, C. Belatreche*
- 1.12 Genetic variation for tolerance to heat stress in dairy small ruminants: results obtained in Spain Spain  
*A. Menéndez-Buxadera, J.M. Serradilla, F. Arrebola, I. Clemente, J.A. Castro, J. Osorio, R. Torres, A. Molina*
- 1.13 Rangeland production and use in the Rif mountains of northern Morocco Morocco  
*Y. Chebli, M. Chentouf, R. Mrabet, A. Keli*
- 1.14 Gas production technique to evaluate the nutritive value of Opuntia's cladodes from Algerian arid area Algeria  
*A. Chentli, L. Bouazza, S. Medjekal, L. Gillmann, H. Bousseboua*
- 1.15 Effect of feeding more forage on the quality of fattening lamb's meat Morocco  
*A. El Housni, E.H. El Maadoudi, M. Bendaou*
- 1.16 Strategy of improvements in nutritious values of fallows in rainfall areas of Morocco Morocco  
*A. El Housni, E.H.L. Maadoudi, M. Bendaou*
- 1.17 Grains de lupin en substitution au tourteau de tournesol dans la ration des agneaux en croissance-engraissement Morocco  
*E.H. El Maadoudi, A. El Housni*
- 1.18 Sweet and bitter lupine seeds in diets for growing and fattening lambs Morocco  
*E.H. El Maadoudi, A. El Housni*
- 1.19 Local goat milk characterisation in Tunisia Tunisia  
*A. Gaddour, S. Najari, M. Abdennebi, S. Arroum, M. Assadi*
- 1.20 Effect of replacing soybean meal by faba bean on semen parameters of the "Queue Fine de l'Ouest" rams Tunisia  
*R. Gmati, S. Ben Said, M. Mehouchi*
- 1.21 Production laitière de la chèvre du Sahel burkinabé en alimentation intensive et semi-intensive utilisant les ressources locales Burkina Faso  
*I. Gnanda, A. Traoré, A. Kaoré, M. Zongo*
- 1.22 Le système de conduite de 3 chevrotages en 2 ans : Outil de gestion moderne de la conduite technique de la race caprine locale Draa Morocco  
*M. Ibnelbachyr, C. Er-Rouidi*
- 1.23 Study of the differential microbiological quality of sheep milk relative to the standard plate counts Spain  
*L. Jiménez, B. Oliete, M.D. Pérez-Guzmán, R. Arias*

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| 1.24 | Dégradabilité des grignons d'olive et pulpe de caroube et effet de leur incorporation sur les performances d'engraissement des agneaux<br><i>K. Jorfi, I. El Idrissi, M. Mounsif, A. Keli</i>   | Morocco      |
| 1.25 | Enhancement of the motility during the liquid storage of ram semen by Argan oil<br><i>L. Allai, El Amiri, X. Druart, A. Fatet, B. Nasser</i>  | Morocco      |
| 1.26 | Effect of vegetal extracts on Coccidiosis in fattening lambs fed with concentrate<br><i>J. Le Scouarnec, G. Benzoni, J.P. Guitard, D. Marzin, A. Guyonvarch</i>   | France       |
| 1.27 | Factors affecting somatic cells count in milk of Murciano-Granadina goat breed<br><i>F. Cosci, F.A. Ruiz, J.M. Castel, J. Pleguezuelos, F. Martinez, R. Gutiérrez, Y. Mena</i>  | Spain        |
| 1.28 | 1) Response to water deprivation by lactating ewes fed spineless cactus pads<br><i>M. Sibaoueih, B. El Amiri</i>  | Morocco      |
| 1.29 | Preliminary assessment of phenotypic and genotypic parameters associated with resistance to gastrointestinal parasites infestation in Burkina Faso sheep<br><i>A. Traore, J.L. Royo, A. Kabore, I. Alvarez, I. Fernández, A. Soudre, W. Béré, M. Sanou, H.H. Tamboura, F. Goyache</i>                           | Burkina Faso |
| 1.30 | Effet de l'utilisation des huiles essentielles (du thym, du romarin, de l'origan et du myrte) sur les propriétés physicochimiques, microbiologiques et sensorielles du fromage de chèvre frais et semi-affine<br><i>S. Zantar, M. Zeourk, M. Zahar, B. Saidi, Z. Notfia, A. Laglaoui, T. Larbi, M. Chentouf</i> | Morocco      |
| 1.31 | Adéquation des souches lactiques autochtones isolées de lait cru de chèvre pour l'élaboration du fromage semi affine<br><i>S. Zantar, H.M. Zeourk, O. El Galiou, A. Laglaoui</i>  | Morocco      |

## Session 2. Research in sheep and goats: structures, approach, investment and results obtained

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| 2.1 | Nutritive evaluation of some browse plant species collected from Algerian arid rangelands by chemical analyses and in vitro gas production<br><i>S. Boufennara, L. Bouazza, S. López, H. Bousseboua, R. Bodas,</i>   | Algeria |
| 2.2 | Investigation of pregnancy-associated glycoproteins (PAGs) by means of an enzymoimmunoassay (ELISA) sandwich kit for pregnancy monitoring in sheep<br><i>B. El Amiri, P. Delahaut, Y. Colemonts, N. Melo de Sousa, J.F. Beckers,</i>                       | Morocco |
| 2.3 | Evaluation de l'introduction de la race Alpine pour l'amélioration des populations caprines locales. Impact de l'utilisation des boucs alpins au niveau du bassin versant de l'Oued Lakhdar (Province d'Azilal-Maroc)<br><i>M. Ibnelbachyr, M. Mounsif</i> | Morocco |
| 2.4 | Caractérisation génétique des races ovines algériennes<br><i>M. Lafri, S. Harkat, M. Ferrouk, A. Routel, M. Medkour, A. Dasilva</i>  | Algeria |
| 2.5 | Modelling for sheep and goat production systems. Optimal management of small ruminants and grazing activities<br><i>Mohamed Habib Sellami</i>  | Tunisia |

## Session 3. Technology transfer in sheep and goat production systems: models, tools and actors

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| 3.1 | Enjeux du développement de l'élevage ovin en zones céréalières semi-arides algériennes<br><i>K. Abbas</i>   | Algeria      |
| 3.2 | Technical and socio-economic characterisation of small ruminants production systems in Saudi Arabia: results from a survey to stockbreeders<br><i>R.S. Aljumaah, M.A. Alshaikh, A. Alyemni, M. Ayadi, S. Sayadi</i> | Saudi Arabia |
| 3.3 | Plan de gestion écosystemique : un outil pour le développement de la filière "viande rouge ovine"<br><i>A. Bechchari, M. Mokadiri, M. Cherkaoui, A. Messoudi, A. Maatougui, A. Ramdane</i>                          | Morocco      |
| 3.4 | Caractéristiques des producteurs ovins en Algérie : cas des éleveurs de Djelfa<br><i>F.A. Belhouadjeb, F. Chehat</i>  | Algeria      |
| 3.5 | Impact de surpâturage sur la dégradation des parcours steppiques Sud-oranais de Naâma (Algérie)<br><i>A. Benaradj, H. Boucherit, O. Hasnaoui, F. Aibout,, A. Boulassel, D. Baghdadi</i>                             | Algeria      |
| 3.6 | L'élevage pastoral dans la steppe sud-oranaise de Naâma<br><i>A. Benaradj, H. Boucherit, F. Aibout, O. Hasnaoui, K. Mederbal, D. Bagdadi</i>  | Algeria      |
| 3.7 | Empirical studies of innovation on sheep farms in eastern Poland<br><i>W. Bojar, N. Cirier, F. Diniz, A. Junkuszew, A. Le Scouarnec</i>   | Poland       |
| 3.8 | Operation of small ruminant farms in the oasis of Tillouline, southwest Algeria<br><i>A. Boubeker, M.T. Benyoucef</i>   | Algeria      |

- 3.9 Etude de quelques ressources mobilisables pour une qualification des élevages de production de viande ovine dans la province de Boulemane  
*A. Boughalmi, A. Araba, M. Yessef, B. Elamiri* Morocco
- 3.10 Approach to phenotypic characterisation of northern Morocco goat population  
*N. El Moutchou, A. González, K. Lairini, M. Chentouf, E. Muñoz C. González, E. Rodero* Morocco
- 3.11 Milk production, composition of « Beni Arouss » North Moroccan local goat  
*S. El Otmani, H. Btissam, M. Chentouf* Morocco
- 3.12 Amélioration du savoir faire local fromager dans la région du nord  
*B. Farahat Laroussi, S. Zantar, L. Toukour, M. Chentouf, A. Benkhouya* Morocco
- 3.13 Spécificité et diversité des systèmes de production caprine et ovine dans les régions arides tunisiennes. Systèmes d'élevage de petits ruminants en Tunisie  
*A. Gaddour, S. Najari, M. Abdennebi* Tunisia
- 3.14 Effet du système extensif et intensif sur la qualité de la viande ovine dans les régions arides du sud tunisien. Effets du système d'élevage sur la qualité de la viande ovine  
*Amor Gaddour, Sghaier Najari* Tunisia
- 3.15 Rôle et place de la chèvre dans la vie des ménages du Sahel burkinabé  
*I. Gnanda, A. Kabore, A. Traore* Burkina Faso
- 3.16 Condition and perspective sheep sheep breeding in central Europe  
*M. Milerski, M. Margetin, F. Ringdorfer, F. Diniz, T. Gruszecki, A. Junkuszew, W. Bojar, F.J. Lopes de Sousa* Poland
- 3.17 Caractérisation phénotypique de la population caprine locale "Beni Arrous"  
*B. Hilal, S. El Otmani, M. Chentouf, I. Boujenane* Morocco
- 3.18 Adaptation des indicateurs FAO-CIHEAM au système d'élevage caprin intensif du Sud-Est marocain (Ouarzazate)  
*M. Ibnelbachyr, M. Chentouf, M. Benider, A. Elkhettaby* Morocco
- 3.19 L'élevage pour la production des viandes rouges dans les systèmes irrigués au sud-est de la Tunisie : importance et cohabitation future  
*M. Jaouad, R. Sadraoui, K. Gley* Tunisia
- 3.20 Caractérisation et typologie des systèmes d'élevage ovin pastoral dans la région sud-ouest de la Tunisie  
*R. Sadraoui Daly, M. Jaouad, K. Gley* Tunisia
- 3.21 Typologie du système d'élevage ovin dans le gouvernorat de Siliana. Influence du pâturage sur la pratique de l'élevage  
*T. Jemaa, T. Najjar, J. Huguenin* Tunisia
- 3.22 Polish experience in introduction of lamb meat to the local market  
*W. Bojar, F. Diniz, T. Gruszecki, A. Junkuszew* Poland
- 3.23 Caractérisation de l'élevage caprin dans la région montagneuse de Kabylie en Algérie  
*S.A. Kadi, F. Hassini, N. Lounas, A. Mouhous* Algeria
- 3.24 Les éleveurs de Djelfa (Algérie) face à la sécheresse et aux incertitudes sur les ressources pastorales : réactions et pratiques adaptatives  
*M. Kanoun, A. Meguellati-Kanoun, J. Huguenin* Algeria
- 3.25 Conduite des élevages des petits ruminants dans la zone centre-est du Maroc : cas de la commune rurale de Tissaf de la province de Boulemane  
*A. Anjar, M. Mounsif, N. Mokhtari, A. Keli* Morocco
- 3.26 Towards a better understanding of adaptation of local breeds to livestock farming systems: an exploratory methodological proposal  
*J.C. Paoli, A. Viollet, P.M. Santucci, J.Y. Gambotti, A. Lauvie* France
- 3.27 Assessment of agriculture technologies for use in arid regions of Egypt  
*H.R.M. Metawi* Egypt
- 3.28 Genetic structure of two minor Spanish goat breeds : Blanca Andaluza and Blanca Celtiberica  
*M.E. Muñoz-Mejías, A. González, N. Elmoutchou, E. Rodero* Spain
- 3.29 Consumer preferences upon the traditional Andalusian cheese varieties  
*F.A. Ruiz, L. Navarro García* Spain
- 3.30 Diagnosis of forage systems in the semi-arid area of Sétif  
*N. Tedjari, K. Abbas, T. Madani* Algeria
- 3.31 Goat farming in state forest areas in Turkey : lessons learnt over ten years  
*A. Tolunay, V. Ayhan, M. Yilmaz, C. Balabanli* Turkey