Camel diversity survey in El Oued region (south east Algeria)

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SUMMARY

A survey on camel livestock diversity was carried out in 36 herds at the south eastern Algeria in order to implement description of camel herd's farming system. Data collection on the status of the owner, socio-economic importance of the camel breeding, herd composition, farming practices and herd dynamics was preceded using Single-Visit Multiple-Subject Diagnostic Survey (SVMSDS) method. Descriptive statistics were executed to represent herd's diversity, then multivariate analysis (Multiple Correspondence Analysis MCA and Agglomerative Hierarchical Clustering AHC) were used to analyze relationships between observed factors and establish the farm typology. We identified three main types of production systems: (1) small sedentary fattening farms; (2) small to medium size semi-extensive pastoral farms, and (3) large size transhumant breeding farms. This typology represents the heterogeneity of camel farming in the south eastern Algeria. The explaining factors allowed distinguishing, in one hand, pastoral-linked camel herds free mobile or partially controlled breeding with particular income profiles of multiplier breeding farms and milk production, and in other hand, we found the sedentary fattening farms. Further surveys are recommended to identify constraints and requirements of the camel farmers and to promote production improvement strategies in adequacy with camel herd types.

Estudio de diversidad de camellos en la región de El Oued (sureste de Argelia)

RESUMEN

Se llevó a cabo un estudio sobre la diversidad del ganado de camellos en 36 rebaños en el sudeste de Argelia con el fin de implementar la descripción del sistema de cultivo del rebaño de camellos. La recopilación de datos sobre el estado del propietario, la importancia socioeconómica de la cría de camellos, la composición del rebaño, las prácticas agrícolas y la dinámica del rebaño se precedió utilizando el método de encuesta de diagnóstico de sujetos múltiples de visita única (SVMSDS). Se ejecutó estadística descriptiva para representar la diversidad del rebaño, luego se utilizaron análisis multivariados (Multiple Correspondence Analysis MCA y Agglomerative Hierarchical Clustering AHC) para analizar las relaciones entre los factores observados y establecer la tipología de granja. Se identificaron tres tipos principales de sistemas de producción: (1) pequeñas explotaciones sedentarias de engorde; (2) granjas pastoriles semiextensivas de tamaño pequeño a mediano, y (3) granjas de cría trashumante de gran tamaño. Esta tipología representa la heterogeneidad de la cría de camellos en el sureste de Argelia. Los factores explicativos permitieron distinguir, por un lado, los rebaños de camellos ligados a la pastoral de cría libre móvil o parcialmente controlada con perfiles de ingresos particulares de las granjas de cría multiplicadora y la producción de leche, y por otro lado, encontramos las granjas de engorde sedentarias. Se recomiendan nuevos estudios para identificar las limitaciones y requisitos de los criadores de camellos y para promover estrategias de mejora de la producción en adecuación con los tipos de rebaños de camellos.

INTRODUCTION

A farming system is defined as a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate (FAO

2000). In this study, we generate a typology of camel farms in Souf region covering an arid area of 19 754 098 km2 at the south eastern Algeria. Camels are known as multipurpose animal in the study region, while evolution in the activities linked to camel herd's management had been observed last two decades making crucial to underline the farm diversity. Identifying and understanding this variability based on farmer surveys; provide us relevant criteria for proposing efficient tools for production improvement.

MATERIAL AND METHODS

For this study, data were collected from 36 camel herds using SVMSDS (Single-Visit Multiple-Subject Diagnostic Survey) which are validated according to ILCA (1991).

17 nominal and ordinal variables on the farming practices, socio-economic importance of camel herd, camel herd composition and dynamic were described.

Following exclusion of incongruent observations, descriptive analysis and multiple correspondence analysis (MCA) followed by Agglomerative Hierarchical Clustering (AHC) were processed using SPAD 5.5.

RESULTS AND DISCUSSION

After checking descriptive analysis, correlation and homogeneity among the herds, we tested 17 variables in the MCA (**Table I**). The two first components explain more than 33 % of the total variability

in camel herds. The third component explains 7 % and the fourth component explain 7% of the total herd's variability.

Using 10 first components in MCA which collectively explained 88% of the total variation, the AHC algorithm generated three clearly distinguishable farm types (**Figure 1**). Type 1 (33%): Small sedentary fattening farms, Type 2 (50%): Small to medium size semi-extensive pastoral farms and Type 3 (16.67%): Large size transhumant breeding farms. Each Farm group was described according to contribution of the variables.
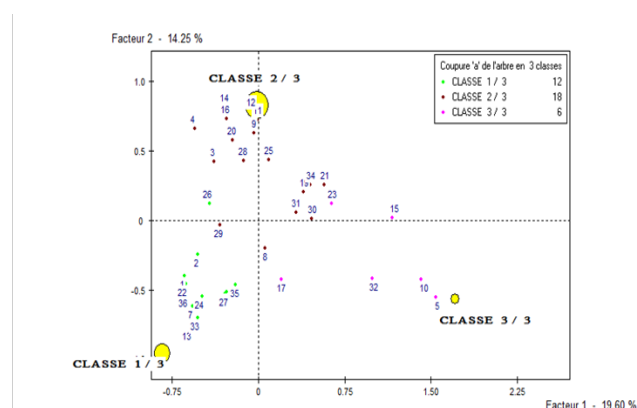
Figure 1. Herds of the three farm types projected on the plane of the first two dimensions of the ACM (See text for farm groups) (Rebaños de los tres tipos de granjas proyectados en el plano de las dos primeras dimensiones del ACM (Véase el texto para grupos de granjas).

Table I. Definition of variables for herder's statute (C1-C6), herd description (C7-C9), farming practices (C10-12) and herd dynamic and production (C13-C17) used to generate the farm typology (Definición de variables para el estatuto del pastor (C1-C6), la descripción del rebaño (C7-C9), las prácticas agrícolas (C10-12) y la dinámica y producción del rebaño (C13-C17) utilizadas para generar la tipología de la granja).

Abbreviation	Variable	Class
C1 .	Age of camel owner (years)	3 MODALITES: (1)31-40, (2)41-60, (3)>60
C2 .	Camel herd acquisition	3 MODALITES: (1)Heritage, (2) Purchase, (3) Heritage + Purchase
C3 .	Camel herder income	2 MODALITES: (1) Only agricultural, (2) Agricultural + no agricultural
C4 .	Standing in camel breeding	2 MODALITES: (1) Since years, (2) In recent years
C5 .	Herd membership	2 MODALITES: (1) Single breeder (2) Collectivity
C6 .	Labor	3 MODALITES: (1) Familial, (2) Guardian, (3) Breeder + Guardian
C7 .	Herd mobility	3 MODALITES: (1) No mobility, (2) All year round, (3) Partial
C8 .	Camel herd composition (heads)	3 MODALITES: (1) < 50, (2) 50-100, (3) > 100
C9 .	Other species in association to camel	4 MODALITES: (1) Sheep, (2) Goat, (3) Cow
C10 .	Free camel grazing	2 MODALITES: (1) Yes, (2) No
C11 .	Complementary food practice	2 MODALITES: (1) Yes, (2) No
C12 .	Means of survival during shortage	3 MODALITES: (1) Nomadism, (2) Food purchase, (3) Herd reduction
C13 .	Camel purchase (heads)	3 MODALITES: (1) 0 , (2) 1-50, (3) >50
C14 .	Camel selling (heads)	3 MODALITES: (1) 0 , (2) 1-50, (3) >50
C15 .	Herd renewal	2 MODALITES: (1) Yes, (2) No
C16 .	Owners income by camel livestock	3 MODALITES: (1) Milk, (2) Fattening, (3) Replacement animals
C17 .	Destination of camel products	3 MODALITES: (1) Self-supply, (2) Selling, (3), Self-supply + selling

CONCLUSION

The present study has enabled to give overview of the current camel farming systems in the study region and allow identifying their common production priorities. The pastoral-linked camel herds are highly or partially mobile with particular income profiles of multiplier breeding farms and milk selling. The sedentary herds are particularly of fattening farms model.

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