

Indigenous domestic turkeys of Oaxaca and Quintana Roo, Mexico

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Summary

The presence and role of indigenous turkeys in Oaxaca and Quintana Roo, Mexico, were investigated by means of on-site assessment and an orally administered questionnaire. Questions included breed characteristics, uses, management conditions, advantages and limitations of the breed. An indigenous breed of turkey in Oaxaca and Quintana Roo was described. A strong interest in the raising and commerce of turkeys in Oaxaca was noted, however in Quintana Roo substantial reductions in numbers of turkeys have occurred over the last two decades. Mortalities of turkey poults ranging from 50-100% due to a disease with symptoms compatible with *Histomonas meleagridis* infection were reported. This appears to be the most significant limiting factor to raising turkeys in a back-yard type of system in Oaxaca and Quintana Roo. Raising turkeys separately from chickens is probably the most effective strategy for decreasing indigenous turkey poult mortality of this type.

Key words : Genetic resources, *Histomonas meleagridis*, Historic origins, Characteristics, *Meleagris gallopavo*

Résumé

La présence et le rôle du dindon de race indigène en Oaxaca et Quintana Roo au Mexique ont été étudiés à travers une évaluation sur place et un questionnaire oral. Ce dernier comprenait les thèmes suivants:

caractéristiques de la race, utilisation, élevage, avantages et désavantages de la race. La présence d'une race indigène de dindon en Oaxaca et Quintana Roo fut confirmée et décrite. Un fort intérêt vers l'élevage commercial du dindon de race indigène fut noté en Oaxaca. Par contre, d'importantes pertes de dindons se sont produites en Quintana Roo au cours des deux dernières décennies. Le facteur le plus limitant pour l'élevage du dindon dans un système de cours a été le taux de mortalité parmi les dindonneaux de 50 à 100% du à une maladie qui présentait des signes compatibles avec une infection d' *Histomonas meleagridis*. La réduction effective du taux de mortalité parmi les dindonneaux de race indigène pourrait diminuer en séparant l'élevage des dindons de celui des poules.

Introduction

The domestic forms of the turkey in Central and South America are derived from the South Mexican Turkey (*Meleagris gallopavo gallopavo*) (Crawford, 1992). The wild turkey (*Meleagris gallopavo*) is represented by six subspecies, of which three are historically recorded from Mexico: the nominate subspecies, the South Mexican Turkey (*M.g. gallopavo*), the Rio Grande Turkey (*M.g. intermedia*), and the Gould's Turkey (*M.g. mexicana*). The former range of the South Mexican Turkey included the area between Puerto Vallarta (state of Jalisco) and Acapulco (state of Guerrero), on the Pacific coast, east to

Tuxpan (state of Veracruz) and Veracruz (state of Veracruz) on the Gulf of Mexico. Schorger (1964) stated that the range of the South Mexican Turkey was greatly reduced, and restricted to only the southern part of Michoacan. At the present time, three of the larger zoological gardens in Mexico - Mexico City (Parque Zoologico de Chapultepec), Guadalajara (Parque Zoologico de Guadalajara), and Tuxtla Gutierrez (Zoologico Miguel Alvarez del Toro) - had no wild turkey breeding groups, or any specimens on display (Mallia, personal observations, 1997). Domestication of the South Mexican Turkey probably occurred near Oaxaca, possibly as early as the Neolithic Age in Europe (FAO, 1995). There is a great sense of urgency to preserve the genetic variability of the indigenous strains of domestic turkeys in Mexico, and information should be collected and assessed, to prevent their extinction, as was the fate of the domesticated turkey of the Puebla Indians in southwestern U.S.A. (FAO, 1995).

Documented Observations by the Spanish on First Encountering the Domestic Turkey Present in Mexico

There are numerous early accounts of the first encounters of the Spanish with domestic turkeys in Mexico; this testifies to the turkey's well-established presence as a domestic bird and food source for the indigenous people at the time of the Spanish landing in Mexico. The Spaniards were presented with turkeys, together with other foods, on several occasions. Cordoba and his expedition arrived in Campeche in the state of Campeche, Yucatan peninsula, in 1517, and were presented with several dewlapped fowl of the size of a peafowl by the local inhabitants; there were numerous turkeys present in a nearby farm (de Las Casas, 1951, in Schorger, 1964). Members of the Grijalva expedition in 1518 were given turkeys by the Indians of Cozumel island, of the Yucatan Peninsula, and also by the inhabitants in the area

corresponding to the present-day city of Veracruz in the state of Veracruz on the Gulf of Mexico (Diaz del Castillo, 1933, in Schorger, 1964). The Cortes expedition of 1519 observed that the domesticated turkey was widely present in most villages and towns in Mexico, throughout the Yucatan Peninsula, along the Gulf coast to Veracruz, and inland to the central highland where present-day Mexico City stands (de Tapia, 1866 in Schorger, 1964; Diaz del Castillo, 1933, in Schorger, 1964). Turkeys were the most readily available and economical meat-source in Mexico (Prescott, 1894, in Schorger, 1964), with numerous turkeys being sold in the local Indian markets (Lorenzana, 1770, in Schorger, 1964; Diaz del Castillo, 1933, in Schorger, 1964). Male turkeys were large, some with as much meat as two peafowls from Spain (Motolinia, 1914, in Schorger, 1964). The female is smaller than the male, and hen turkey meat was said to be particularly good to the palate (Sahagun, 1938, in Schorger, 1964). The domestic turkeys were flightless, and were present in several colour forms, including black, brown, red, and white (Sahagun, 1938, in Schorger, 1964).

Materials and Methods

Time and spatial aspects of the study

Oaxaca state was selected for this study because the domestication of the turkey may have first occurred in this region. The Zapotec people that inhabit the valleys around the city of Oaxaca have retained much of their culture, arts, and traditions, hence the higher probability of encountering domestic turkeys in this state. The Valle de Tlacolula runs east of the city of Oaxaca, and the towns and markets of Tlacolula, Santa Ana del Valle, Teotitlan del Valle, and Mitla were visited for this study. The Maya of the Yucatan Peninsula also preserve much of their culture and tradition, and in Quintana Roo this is particularly evident in the south and inland parts of the state; the area of choice was considered relatively uninfluenced by large-scale tourism in the northern part of the

state, yet relatively easily accessible. The area included for the study were the towns, villages, hamlets and isolated ranches along Highway 307, clustered around Felipe Carrillo Puerto, Nohbec, Xul-ha, and on the Costera Bacalar, between Bacalar Pueblo and Cenote Azul. The information for the study was gathered in January 1996 and June 1997.

Questionnaire

Participants in this study included local inhabitants rearing, selling, or purchasing turkeys in Oaxaca and Quintana Roo in January 1996 and June 1997. They were located by visiting the towns on their market day, thus procuring vendors and purchasers on site. Turkey-growers and other purchasers were also identified in the towns and villages either by the presence of turkeys in enclosures adjacent to homes, or by word of mouth. A questionnaire in Spanish was orally administered to 18 turkey breeders in Oaxaca, and 16 in Quintana Roo. Information on population data, description of the breed, its uses, management conditions and performance were collected. A version of the questionnaire in English is reported in table 1. Photographs were taken showing facial characteristics (Figure 1), body conformation and plumage (Figure 2), and the systems under which the birds were raised (Figures 3 and 4).

Results

General information

The narrow-breasted turkeys kept in Oaxaca and Quintana Roo were classified as indigenous: the stock was purchased or bartered locally, usually at the village level, or at local markets where birds from nearby villages and towns marketed. These turkeys are known as *pavo*, which is the standard name for turkey in Spanish. Some people refer to the indigenous turkey as *pavo creollo* to distinguish it from imported, synthetic, broad-breasted strains of turkeys.

Population data

The population size was not estimated because the non-random nature of the sample did not lend itself to calculating a valid population estimate. The size of the individual turkey clusters ranged from one to eighteen. Most backyard clusters contained between five to twelve turkeys. The ratio of males to females was usually 1:3-5; most of the breeders confirmed that this was an ideal ratio of males to females within a harem. One or several harems were often kept together within the same enclosure. The distribution of the indigenous Mexican turkey by location and sex of bird is summarized in table 2. Anecdotal information suggests that the number of females kept in the Valle de Tlacoloula, Oaxaca, appears to be fairly stable; however, a decline has been reported by participants in southwestern Quintana Roo since the late 1970s'. The risk status of the indigenous turkey in Oaxaca may, however, still be described as endangered, as the number of birds available appears to be fairly low, despite the purported stability in numbers of breeding birds. In the area of southwestern Quintana Roo covered in this study, the risk status for indigenous turkeys can probably be described as endangered.

Description of the breed

All turkeys observed in both states were markedly tame and of a calm disposition; they could easily be approached, and were all flightless. The turkeys mixed easily with each other, and also with other species such as muscovies, Pekin ducks and domestic fowl. Various colour phases were present (Figures 1 and 4): black, red (buff), and white were present as pure colours, with all feathers on the same turkey being the same shade. Minor variations of tonality were observed for the buff specimens, where the tail feathers, and wing primaries and secondaries were markedly paler. Pure black, white, and buff specimens did not have a metallic sheen of the plumage. White and buff specimens were not observed in Quintana Roo. Birds

Table 1. Domestic turkey questionnaire for breeders of the indigenous Mexican turkey; Oaxaca and Quintana Roo.

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- Q1. How many birds, males, females, young, do you have, and where are the turkeys kept ?
- Q2. How many females are ideally kept for each male ?
- Q3. Do they forage, do you feed them, or both ?
- Q4. From where do you obtain new stock ?
- Q5. Do you keep chickens or ducks with the turkeys ?
- Q6. If Q5.is in the affirmative: do you perceive any problems ?
- Q7. At what age do the males and females mature ?
- Q8. What weight do the males and females have at maturity ?
- Q9. What colour are the eggs, does the hen incubate the eggs, how many does she lay annually?
- Q10. What is the morbidity and mortality of the young, and if so, mainly at what age ?
- Q11. How do you notice that the turkey is ill, and how many of the ill recover ?
- Q12. What is the main purpose behind rearing turkeys ? Any other uses ?
- Q13. Why do you breed chickens ?
- Q14. Is there a good market for turkeys ?
- Q15. If Q14 is in the affirmative: what stops you from raising more turkeys ?
- Q16. Is there a particular feather colour preference for turkeys ?
- Q17. Have you heard of the large, fleshy white turkeys raised in the U.S.A. ?
- Q18. Have you ever cross-bred the non-indigenous heavy birds with the local ones ?
- Q19. Do you ever use a veterinarian, or veterinary products for the turkeys when ill ?
- Q20. Would you welcome further studies on the health and production of your own turkeys ?
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described as brown most closely resembled the wild-type turkeys, and had numerous pale barring and mottling of the feathers, especially of the tail, primaries, secondaries and wing coverts; a metallic sheen of the plumage usually accompanies this colour phase. The black and brown colour phases were predominant in Oaxaca, and the only ones present in Quintana Roo. There were also black birds, but with a buff spot at the extremity of the feathers, giving the turkeys a slightly mottled appearance; this specimen type was particularly frequent in Quintana Roo. Black specimens with occasional, irregularly placed white or buff feathers were present in Oaxaca; unlike the pure black birds, a metallic sheen of the plumage was present. Another colour phase observed in Oaxaca had a white base colour, and with black or chocolate markings symmetrically

distributed through the body; individual feathers had repeated barring and shadings across the length of the feather, but particularly towards the apex. In Quintana Roo, approximately 50% of the turkeys were black, and 50% were brown or mottled black. In Oaxaca, about 40% were black, 35-40% brown, and 20-25% were white, buff, or of mixed colours. Despite the wide range of colour phases, body size and confirmation was fairly homogeneous across both states (Figures 2-4).

A well-developed snood, dewlap and caruncles are strong markers for domesticity; all features were markedly evident in all turkeys, including brown phase specimens with wild-type plumage (Figure 1). The white and buff birds had only a limited amount of blue skin, present around and below the eyes; the rest of the head and neck, and overlying



Figure 1. Facial characteristics of indigenous domestic turkeys (Oaxaca).

caruncles were bright red. The black and brown phases had a more variable distribution of blue skin; Quintana Roo birds had relatively little blue skin, distributed as for the white or red phases. Oaxacan black, brown and mixed-colour phases often had extensive areas of vivid blue skin extending across the face and neck and nape, covered with vivid red caruncles. The snood, dewlap and caruncles were red for all turkeys, although well-delimited areas with a dark pigmentation were present on the snood of some of the black phase turkeys. Beaks, shanks and feet were pink-tan for white and buff birds, and predominantly dark grey or black in black and brown turkeys. The egg colour was reported to be pale buff for all colour phases.

Uses, management conditions and performance

The indigenous turkey was reported to be kept primarily for meat in Oaxaca and Quintana Roo. Many of the growers, especially in Oaxaca, also had a strong sense of pride in the tradition of raising the multi-hued bird, and kept several specimens in enclosed plots of land in front or adjacent to their homes (Figure 3). The convenience of the back-yard type of management system is an advantageous factor that was frequently commented upon by participants of this study. When reared in enclosed compounds having numerous trees and shrubs, the birds were encouraged to forage among leaf litter, with little or no feed supplementation (Figure 4). Turkeys kept in smaller, unpaved

Table 2. Distribution of the indigenous Mexican turkey by location and sex of bird.

Location	Number of clusters (by location) Count	Males Females
Mitla	5	9 32
Santa Ana del Valle	4	8 20
Teotitlan del Valle	4	7 28
<i>Oaxaca (Total)</i>	18	41 114
Tlacolula	5	9 (17 ¹) 34
Costera Bacalar	5	9 36
Felipe Carillo Puerto	4	4 21
Nohbec	4	4 16
Xul-ha	3	3 9
<i>Quintana Roo (Total)</i>	16	20 82
Combined Areas (Total)	34	61 196

¹Includes males for sale at the market

compounds and yards were supplemented with commercial poultry mash feed and food scraps (Figure 3).

For turkey buyers in both Oaxaca and Quintana Roo, the purchase of turkeys was either for breeding purposes, or for special occasion meal preparations; the meat of slower-growing, non broad-breasted turkeys, especially that of the hen turkey, is considered to be a gastronomic delicacy in these two states, due to its particular flavour and tenderness. Many of the locals who were not familiar with the synthetic, broad-breasted strains of turkeys were impressed by descriptions of the quantity of meat present in these hybrids. However,

people who had tasted meat from broad-breasted turkeys were unanimous in stating that its organoleptic properties were markedly inferior to that of the indigenous birds, specifically in that it was too dry and lacked flavour. Birds are not used for breeding until they are at least a year old; the participants in this study suggested that at this age females weigh around 12-16 pounds, and males 15-20 pounds. However, mature males were said to reach 25-28 pounds. The long time necessary for maturation, coupled with high mortality rates, were said to be the reason for the high prices of adult indigenous turkeys.

Occasionally, turkeys were kept in small pens with domestic fowl, and fed exclusively on commercial poultry mash feed and food scraps; these turkeys were few in number, and often under-sized. On enquiry, it was determined that these specimens were usually the surviving runts of clutches of turkey poults. Indeed, turkeys raised with domestic fowl, especially in restricted areas, experienced high mortality rates; poults of 5-12 twelve weeks of age experienced mortalities of 50-100%. Older turkeys were also affected, but mortalities were considerably lower. Sick turkeys were quiet, depressed with lowered heads and ruffled feathers, and droppings were pale and loose. The unpredictable, and often poor survival rate of turkey poults is one of the major limiting factors reported by the local people for the success in rearing indigenous turkeys in the traditional manner. This has resulted in larger numbers of domestic fowl being reared instead of the turkey.

Discussion, Conclusions and Recommendations

The turkeys examined in this study appear to be a distinct population, the result of a long history of domestication in Mexico. The localities where turkeys were more numerous coincided with geographical areas inhabited by ethnic groups with strong cultural identities, as evidenced by the richness of their costumes, weaving, and handicrafts. This is particularly true for the Zapotec in the Valle de Tlacolula, east of the city of Oaxaca where the study in Oaxaca was conducted. Fewer turkeys were observed in the other state included in the study, southwestern Quintana Roo. It is possible that the influence of the highly-developed Cancun - Tulum corridor further north, with its newly - found wealth based on tourism, is having a modifying effect on the adjacent parts of the state. Most Mayans in this region do not wear



Figure 2. Body conformation and plumage of indigenous domestic turkeys (Oaxaca).



Figure 3. Turkeys raised under back-yard conditions (Oaxaca) with ducks and chickens.

the traditional costume, nor are local handicrafts particularly evident. It seems more likely that the indigenous turkey will persist in Oaxaca; the fine qualities of turkey meat, and specifically that of the indigenous turkey, are well noted, as is the convenience of the back-yard management system with which they are raised. Recognition of their value augers well for their survival.

More detailed studies on the morphometric characteristics and production data on a larger sample of turkeys are necessary. Future studies should probably focus on Oaxaca, where substantial populations with a wide genetic pool seem to still be present; a wider area within the state should be also covered.

A major concern for people raising indigenous turkeys with the back-yard type of system is the poor survival rate of turkey poults. The symptoms and mortality rates suggested by the participants would indicate that *Histomonas meleagridis* infection

(blackhead) is responsible for the pronounced losses. Chickens habitually harbour the caecal worm *Heterakis gallinarum*, and the worm often carries *H. meleagridis*. Earth worms can also carry *H. gallinarum* and *H. meleagridis*, and probably represent an important strategy for the long-term survival of the caecal worm and protozoan in the soil (Levine, 1985). The epidemiology of blackhead indicates that turkeys should never be reared on the same site as chickens, yet the mixing of turkeys and fowl is standard practice in Oaxaca and Quintana Roo. Further studies are necessary to confirm the presence of *H. meleagridis* infection in indigenous turkeys. Education through extension work may help by promoting strategies that limit the spread of blackhead.

Ex-situ conservation may be achieved through the collection of representative specimens of indigenous turkeys for placement in zoological gardens and agriculture institutions; this may be the only realistic option for turkeys in Quintana Roo,

where populations appear to have dropped drastically over the last two decades. *In-situ* conservation may be promoted by emphasizing the purported excellent organoleptic traits of meat from indigenous turkeys, and the convenience of their back-yard type system of management. This will probably meet with a substantial degree of success in Oaxaca, where the local inhabitants appear to be more predisposed to recognizing the value of the turkey, as its role is still firmly entwined with current local traditions. Implementing disease-control strategies will also go a long way in making the indigenous Mexican turkey an economically viable option for the production of economical, high quality animal protein in rural Mexico and elsewhere.

Acknowledgments

I would like to thank David Waltner-Toews and Dominique Charron for their helpful suggestions.

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Figure 4. Turkeys raised under back-yard conditions (Quintana Roo) with chickens.

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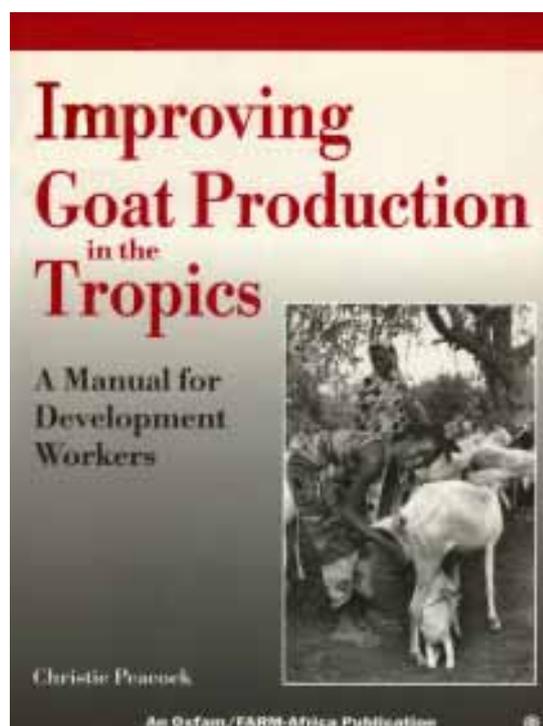
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Improving goat production in the tropics A manual for development workers

FARM-Africa and Oxfam (UK and Ireland)
274 Banbury Road, Oxford OX2 7DZ, UK, 1996
ISBN 0-85598-268

The book is written mainly for developmental workers and extension agents. The language of the book is easy with many illustrations, tables, flow charts and decision aids. The book deals with different goat production systems in the different tropics, e.g. pastoral, agro-pastoral, mixed farming in arid, semi-arid, sub-humid, humid and highland production environments. The step-by-step problem diagnostic procedures and situation objective analysis explained in the book are a very desired feature. Material is presented in 11 chapters: Introduction, Common Problems of Goats in the Tropics, Assessing Goat-production Problems, Basic Nutrition, Improved Nutrition, Goat Health, Breeds and Breeds improvement, Management of Large Goat Farms, Processing and Marketing Goat Products and Goat Improvement Programmes. It also have four pages of glossary and an alphabetical subject index. The book draws much on the experience of its author in Ethiopia through agricultural developmental aid organisations.



A rare breeds album of American livestock

Eds: C.J. Christman, D.P. Sponenberg & D.E. Bixby, Published by
the American Livestock Breeds Conservancy American Livestock

Breeds Conservancy

PO Box 477, Pittsboro, NC 27312 USA

Tel. +1-919-5425704; Fax +1-919 5450022

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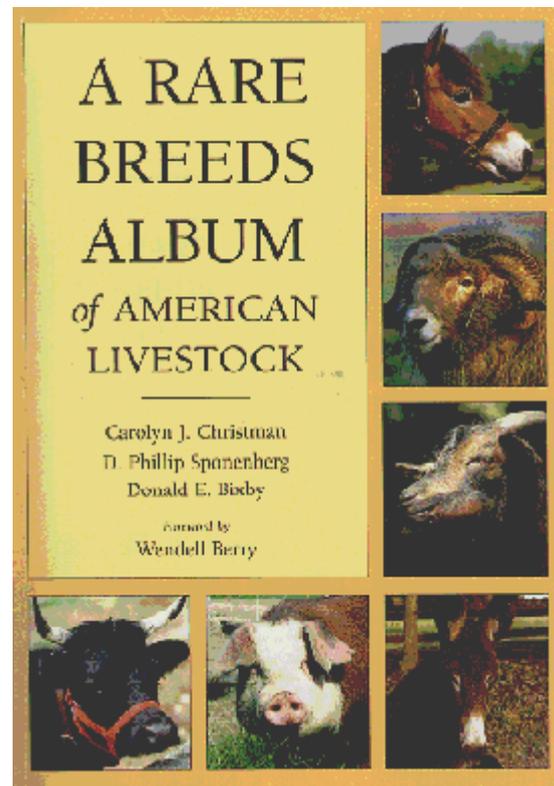
This long-awaited book is the first full-color guide to 70 endangered breeds of cattle, horses, asses, sheep, goats, and pigs in America. It describes each breed's history, characteristics, uses, and status. The book was written to show what is at stake -- the farm animal breeds whose loss would deplete agricultural resources and impoverish the human experience.

Many breeds are so rare that they have disappeared from books and periodicals, and this is a major obstacle to their survival. A Rare Breeds Album addresses the problem by presenting the wide variety of livestock breeds in need of conservation, from the little-known San Clemente goat to the well-recognized Ayrshire cow. The book includes breeds which are native to America, such as the Navajo-Churro sheep and Hereford pig, and those which have been recently imported, such as the Poitou ass. Some rare breeds, such as the Rocky Mountain horse, are becoming popular, while others, such as the Canadienne cow, barely survive.

A Rare Breeds Album of American Livestock is a full-color guide to 70 rare breeds of asses, cattle goats, horses, pigs, and sheep. The book describes each breed's history, characteristics, and uses. It is a compelling portrait of the farm animals at risk. The book is soft cover with 126 pages, 85 color illustrations, a list of breed association addresses, and an index. A Rare Breeds Album will be a unique resource for animal breeders, educators, farmers, historians, veterinarians, and others who

want to learn more about animal diversity or find the right livestock breed for a specific job. Its clear, non-technical style makes the book accessible to students, while the information provided will satisfy the curiosity of scientists.

Through A Rare Breeds Album of American Livestock the authors made a remarkable job in bringing a dear part of the American livestock development heritage to the front of biodiversity and environment issues that are quite relevant to present development efforts.



Introduction to quantitative genetics

Eds: Falconer & Mackay

Forth edition 1996, reprinted in 1997

Addison Wesley Longman Ltd., Edinburgh Gate, Harlow, Essex, CM20 2JE, England

ISBN 0582-24302-5

This book was written with the intention of providing an introductory textbook, with the emphasis on general principles rather than on practical applications. The mathematics does not go beyond simple algebra; neither calculus nor matrix methods are used. Some knowledge of statistics, however, is assumed, particularly of the analysis of variance and of correlation and regression.

The second edition kept the same structure but was somewhat enlarged by the inclusion of developments in the intervening twenty years, and by more attention being given to plants. In consequence the book came to contain a good deal more material than is needed by those for whom the subject is part of a course on general genetics. The section headings, however, should facilitate the selection of what is relevant.

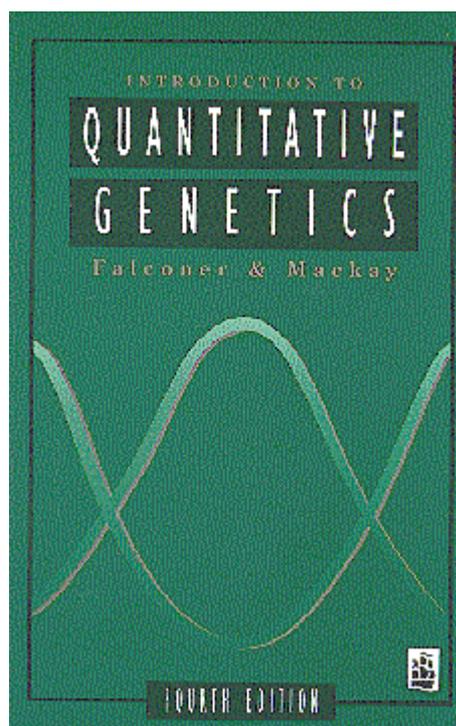
The revisions made in this new edition are less extensive. The desire not to increase the length of the book has meant that many of the recent developments are noted by little more than references to the sources. The demonstration that mutation is not negligible for quantitative genetics has, however, necessitated more substantial revision of Chapter 12 and to a lesser extent Chapters 15 and 20.

The book includes problems at the end of each chapter and their answers at the end of the book

Quantitative genetics is now merging with molecular genetics and this very active area of the subject needs more consideration than it was given in the previous edition.

Accordingly, a new chapter has been added, on quantitative trait loci (QTL's) - the location and characterisation of the genes causing quantitative variation. Chapter 20, on natural

selection, has been largely rewritten, with fuller treatment of mutation and the maintenance of genetic variation; we hope these additions will make the book more useful to students of evolutionary quantitative genetics. In the earlier chapters, the treatment of polymorphism and of neutral mutation has been expanded, and some sections in the chapters on inbreeding have been shortened.



Genetics and analysis of quantitative traits

Eds: M. Lynch & B. Walsh

Sinauer Associates, Inc., 23 Plumtree Road, Sunderland, MA 01375 U.S.A.

Fax: +1-413-5491118; E-mail: publish@sinauer.com

ISBN 0-87893-481-2

This book offers a fresh look at the genetic analysis of quantitative traits, incorporating all elements of mathematics and statistics needed for the understanding of its aspects. The book does a very good job in integrating aspects of quantitative genetics across species, plants and animals and across disciplines, breeding, evolution, etc.

This publication comes in 980 pages including 27 chapters, five appendices, extensive literature listing and comprehensive author, organism and trait indexes

This book has been prepared in a way that will encourage its use as a textbook in quantitative genetics. But the book also provides a coverage of the literature so that it should be useful as a basic reference. Throughout, the authors have attempted to develop central theoretical concepts from first principles. To aid the less statistically sophisticated reader, several chapters and appendices that review essentially all of the statistical tools employed in the book have been included. Wherever possible, theoretical and analytical concepts were illustrated with empirical examples from diverse settings.

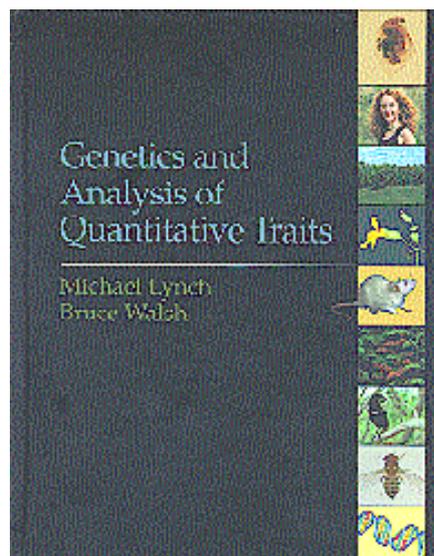
The book is divided into four parts, each containing different chapters.

The first part contains basic notions about quantitative genetics regarding distributions, covariance, regression, correlation, components of environmental variation, inbreeding depression etc.

The second parts analyses the quantitative traits loci principles, starting from polygenic mutations, detecting major genes, mapping and characterising QTL (inbred line crosses and outbred populations).

The third part deals with estimation procedures comprising, among the other, parent-offspring regression, sib analysis, cross-classified designs, genotype x environment interactions, estimation of breeding values, etc.

Finally, the appendices list the expectations of compound variables, path analysis, maximum likelihood estimation.



South African livestock breeding

Eds: J.P. Camper, C. Hunlun & G.J. van Zyl

South African Stud Book and Livestock Improvement Association

P.O. Box 270, Bloemfontein 9300

Republic of South Africa, tel.: +27-51-4489347

ISBN 0-620-22048-1

The aim of the editors of this book was to be as impartial as were humanly possible. No attempt to encourage the use or marketing of one particular breed at the expense of another, or comparative figures was allowed.

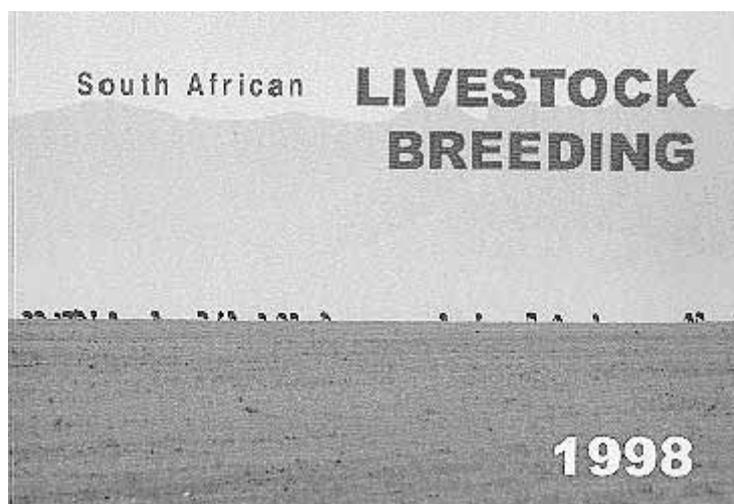
The book starts with a short description of the South African Stud Book and the infrastructures made available by the SA Livestock Improvement Association, its services and functions. After that, statistics of members and animals are reported.

The testing schemes for cattle, pigs, small stock are then described together with the genetic evaluation criteria used for the evaluation of the animals.

A general description of the available biotechnology applications used in South Africa (diagnostic services, artificial insemination, embryo transfer) are then outlined.

After this initial part, the publication follows with the description of the beef, dairy, goat, horse, pigs and sheep breeds. All the information for each breed is schematically reported with clear coloured photos, distribution, performance, population and physical characteristics

In this 1998 edition, apart from explaining the livestock improvement infrastructure in South Africa, the book gives information concerning the origin and improvement of the breeds and the founding of breeders' societies. It has also attempted to give more information on the achievements made during the more recent past. This biennial publication will be a source of valuable information for interested people for many years to come.

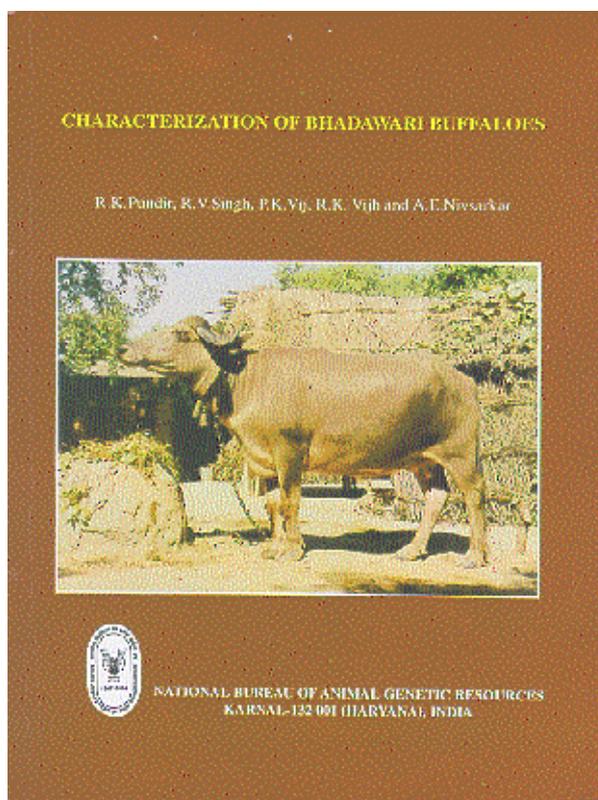


Characterisation of Bhadawari Buffaloes

Eds: P.K. Pundir, R.V. Singh, P.K. Vij, R.K. Viji & A.E. Nivsarkar
National Bureau of Animal Genetic Resources
P.B. No. 129, Karnal 132 001, (Haryana), India
Research Bulletin No. 7, 1977

The Indian Bhadawari buffaloes are well reputed for their milk high fat percentage in India. The breeding tract and natural habitat of this breed is Bah tahsil of Agra, Chakarnagar and Barhpura blocks of Etawah, Amba and Porsa tahsil of Morena and Mahagaon tahsil of Bhind district. Surveys showed steep decline in the population of the breed (from 200 000 in 1977 to 29 000 in 1991) and the trend suggests that the breed may get extinct if suitable measures for conservation are not taken immediately.

Keeping in view the urgent need of conservation and improvement of this important germplasm, this publication attempted to identify, evaluate, compile all the available information and develop norms of this breed for its characterisation and potentialities. Past and present breeding plans, genetic improvement programmes were discussed and breeding and conservation strategies were proposed. The publication covers environment and natural habitat, population, physical characteristics, management practices in the breeding tract, performance, genetic parameters and cytogenetic architecture of the breed.



ICAR technical series No. 1

Ed.: K.R. Trivedi

Proc. of International Workshop on Animal recording for Smallholders in
Developing Countries held in Anand, India, 20-23 October 1997, jointly
organised by ICAR, FAO and NDDDB
ICAR, Via A. Torlonia 15/A, 00161 Rome, Italy
Tel.: +39-6-44238013; Fax: +39-6-44241466; E-mail zoorec@rmnet.it

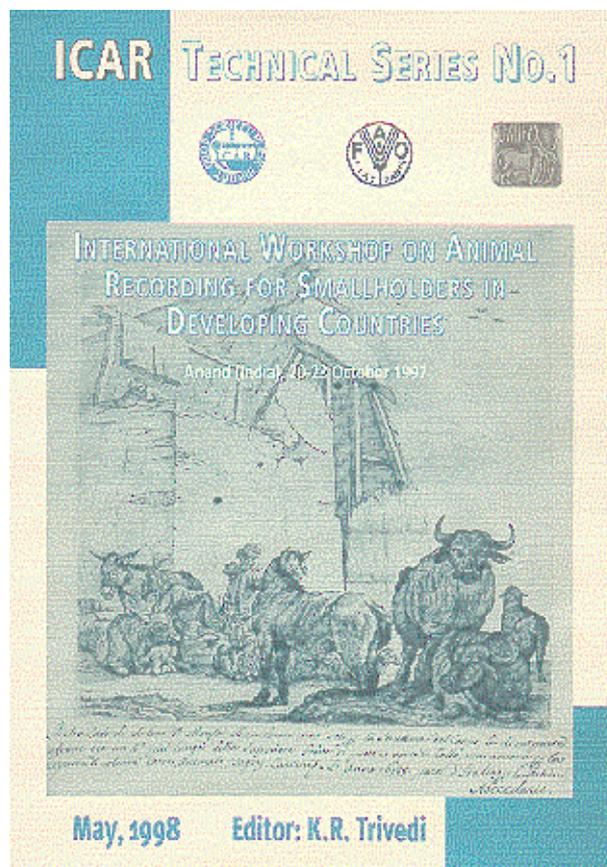
Animal recording in medium input-animal production systems, is a challenging task as it has to take into consideration a wide range of basic factors, such as what records to use to achieve what objectives, the socio-economic context.

ICAR (International Committee for Animal Recording) and FAO (Food and Agriculture Organisation of UN), along with India's National Dairy Development Board (NDDDB), collaborated to organise this Workshop held at Anand, India. The Workshop, attended by experts from 25 countries and organisations, was an appropriate and timely platform for discussing issues related to animal recording with special reference to medium-input production systems.

These Proceedings include national experiences in the form of country reports, seminal papers dealing with basic aspects of recording and recommendations addressed to different international and national bodies.

Divided into five parts, the book starts with the "Recommendations and Summaries" developed during the Workshop, followed by twenty-two "Country Reports", three "General Papers", five "Seminal Papers" and terminates with two "Annexes".

The Proceedings of the workshop will be a most useful document for policy makers and people engaged in the implementation of animal recording programmes in developing countries.



Performance recording of animals - State of the art, 1998

Proc. of the 31st biennial session of ICAR, Rotorua, New Zealand

January 18-23 1998, organised by ICAR, LIC and EAAP

EAAP publication No. 91

Wageningen Pers, P.O. Box 42, 6700 AA Wageningen, The Netherlands

ISBN 90-74134-54-8 ISSN 0071-2477

This publication contains the proceedings of the 31st Biennial Session of the International Committee for Animal Recording (ICAR) held 18-23 January 1998, Rotorua, New Zealand. During the session progress reports were presented by the Sub-committees, Task Forces and Working Groups of ICAR.

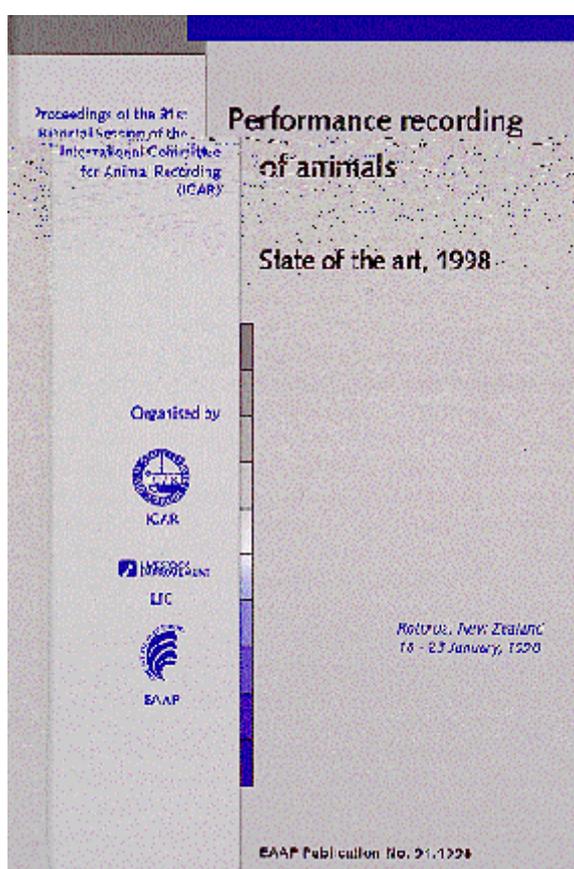
A feature of the 1998 ICAR session was the reports of the Accuracy Working Group and the INTERBULL Audit Working Group.

These two groups have been addressing the very important issues of the accuracy of the animal records and animal evaluations respectively. Both groups' reports, which have yet to be fully considered by ICAR and INTERBULL, are contained in these proceedings.

Four sessions were held containing a range of contributed short papers. Grouped loosely under the headings of Computing, Milk Traits, Cattle Breeding and General, these papers provide a detailed insight into developments which are affecting the direction of animal recording in member countries.

The reports of Task Forces, Sub-committees and Working Groups offer good review of the important work being undertaken by ICAR.

Interspersed with these reports are a number of submitted short papers on topics of particular relevance to the group. In all, over 50 technical papers and reports were presented during the sessions.



The domestic rabbit

Ed.: J. C. Sandford

Blackwell Science Ltd. Osney Mead OX2 0EL, England

Fifth edition

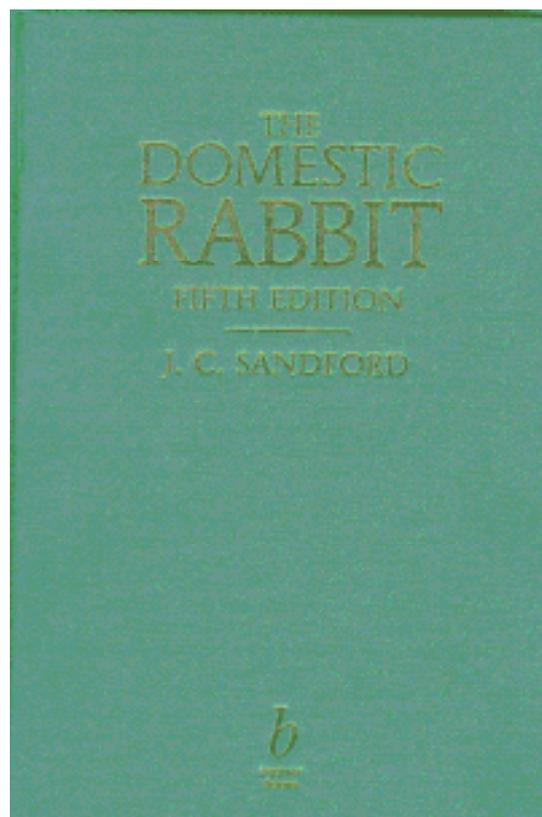
ISBN 0-632-03894-2

Since the first edition of this book was published almost forty years ago there have been many changes in rabbit husbandry worldwide. In order to reflect the so many changes, this fifth edition of the book includes extensive revisions and is now substantially larger, with three new chapters and 47 colour photographs.

In the last few decades, great developments have occurred within the commercial rabbit industry which currently produces over a million tonnes of rabbit meat per year throughout the world. Modern technology has been introduced and many units involved in the production of rabbit meat have greatly increased in size.

A small section of this book was devoted to rabbit production in third world countries where food is so badly needed

The fifth edition contains details of sixteen new breeds and for the first time includes colour photographs of 47 breeds that are covered in the book. Unfortunately, no close ups are provided, despite much effort, for the rare breeds of Beige or Isabella, Blanc de Hotot, Blanc de Termonde, Deilenaar, Pointed Beveren and Squirrel.



El Arca

Boletín de la Sociedad Española para los Recursos
Genéticos Animales (SERGA)

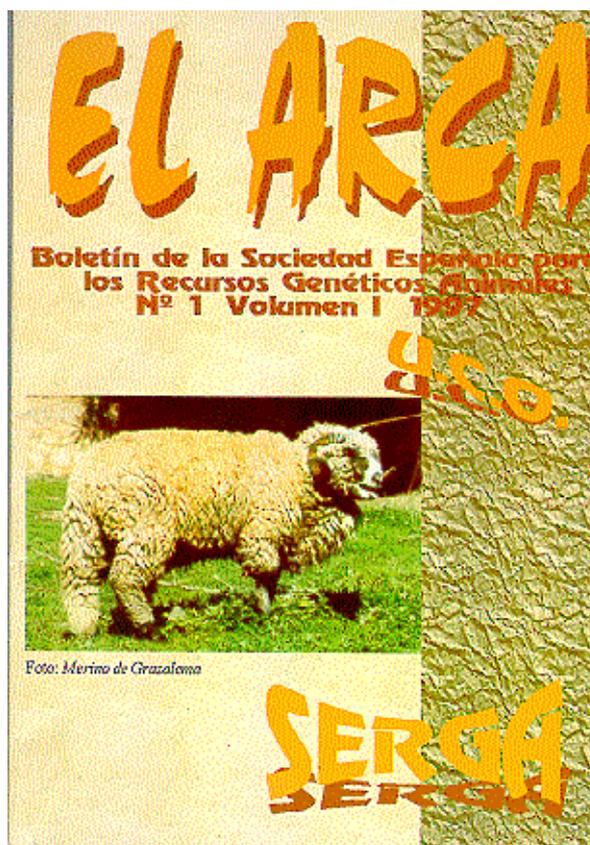
No. 1 Vol. 1 1997

Servicio de Publicaciones de la Universidad de Córdoba
Dpto. Genética y Unidad de Etnología, Facultad de Veterinaria
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El Arca no se ha concebido sólo como una publicación meramente de difusión, sino que también pretende aportar información de carácter científico que se nutrirá especialmente de las contribuciones de aquellos investigadores relacionados con la conservación de nuestro patrimonio genético animal quienes la imprimirán un nivel científico adecuado. Para cuidar especialmente estos aspectos disponemos de un comité científico compuesto por especialistas de los diferentes ámbitos de la gestión de los RGA.

El Arca es un boletín de periodicidad semestral y de difusión gratuita, sin fines de lucro y que se financia con aportes del Servicio de Publicaciones de la Universidad de Córdoba. Por ello cualquier información que en él aparezca, aunque pueda tener un contenido publicitario, no tiene otra intención que colaborar a enriquecer tanto el conocimiento y como la preservación de nuestros RGA y no revertirá en beneficio económico alguno para la Revista.



AMD African Mammals Databank - A Databank for the Conservation and Management of the African Mammals

Institute of Applied Ecology, Via A. Luciani 32, 00197 Rome, Italy
Tel/Fax: +39-6-4403315; E-mail: md@mclink.it

Report to the Directorate-General for Development (DGVIII/A/1) of the European Commission. Project No. B7-6200/94-15/VIII/ENV, Brussels 1998. Vol 1 and 2, pp. 1174

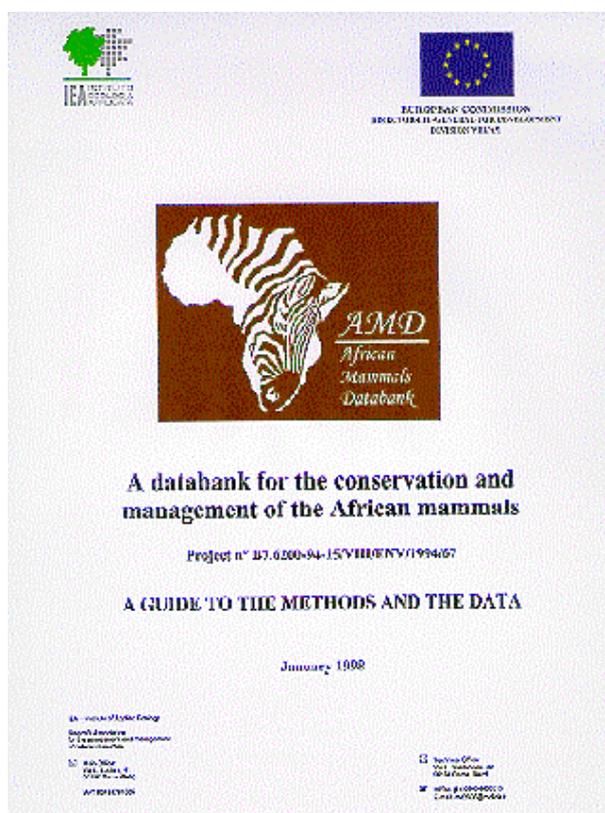
The report deals with a project on the data bank that is now being designed to manage all data on endangered species, including evaluation of population sizes in the various fragments of the species' ranges; it includes both alpha-numeric information and a full range of georeferenced data on species distribution.

The project uses tools such as GIS (Geographical Information System) to store and analyse data for the identification and evaluation of conservation action for the medium and large mammals in Africa.

The project was designed to collect, store, organise and analyse data for distribution to the community of institutions and individuals worldwide concerned with the design and implementation of conservation projects in Africa: as such, its ultimate goal is to provide background data and a service to the conservation community.

A total of 281 species, belonging to 12 orders and 28 families were included in the data bank.

This project intends to contribute to the conservation of the African mammals by providing a first study of their global distribution patterns and by nurturing the new chapter of conservation biology on broad scale analyses. The databank also intends to make available to the conservation and scientific community the raw and semi-processed data that is needed to develop further analyses on distribution trends and patterns.



Recent advances in small ruminant research

Eds: J.E. Lindberg, H.L. Gonda & I. Ledin

Proceedings of the Seminar of the FAO-CIHEAM network of Co-operative Research on Sheep and Goats Subnetwork on Nutrition, jointly organised with the Institute Agronomique et Vétérinaire Hassan II, Rabat (Morocco), 24-26 October 1996

Séminaires Méditerranéennes, Vol. 34

CIHEAM, Ctra. Montanana 177, 50059 Zaragoza, Spain

ISSN 1016-121-X; ISBN 2-85352-172-9

The FAO-CIHEAM Network of Co-operative Research on Sheep and Goats, founded in 1979, aims at spreading knowledge on specific subjects related to small ruminants, particularly those which may offer useful applications for farmers. This network has supported important progress as regards methods applied to small ruminants, practical applications, laboratory research results and improvement of the quality of sheep and goat products (cheese, carcass, etc.). It also has an important mission of spreading technical and scientific information as well as helping technology transfer.

The Sub-network on Nutrition meets every two years to review the subjects included in its programme during the previous meeting. After the meetings of Reading, Grangeneuve, Nancy, Bella, Ostersund and Thessaloniki, the last one was held in Rabat from 24 to 26 October 1996.

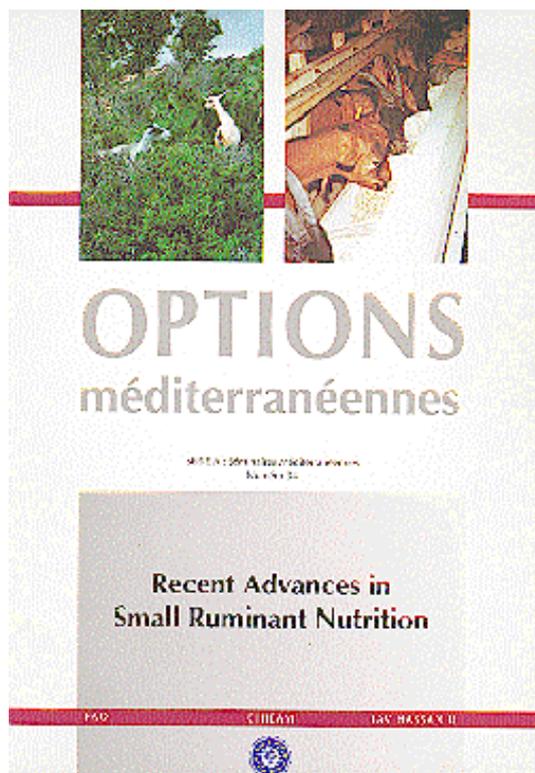
The first two sessions of the Seminar discussed strategy of small ruminants to use the vegetation from tree and shrub Mediterranean rangelands and by-products. The particularities of small ruminants in their use of rangeland biomass and some by-products, as well as their usage constraints, were clearly identified.

Session 3 was devoted to food intake, digestion and metabolism of small ruminants, confirming the characteristics of goat feeding behaviour, specifying supplementation strategies according to the types of basal ration and, showing certain genotype-related metabolic particularities.

In session 4 the adaptation capacity of small ruminants to harsh conditions was

tackled especially the adaptation to water or protein deficiency.

In sessions 5 and 6, the nutritional effects on fertility pregnancy and lactation of ewes and goats, and also on lamb and kid growth were revisited.



Editorial Policies and Procedures

The mission of the Animal Genetic Resources Information Bulletin (AGRI) is the promotion of information on the better use of animal genetic resources of interest to food and agriculture production, under the Global Strategy for the Management of Farm Animal Genetic Resources. All aspects of the characterization, conservation and utilization of these resources are included, in accordance with the Convention on Biological Diversity. AGRI will highlight information on the genetic, phenotypic and economic surveying and comparative description, use, development and maintenance of animal genetic resources; and on the development of operational strategies and procedures which enable their more cost-effective management. In doing this AGRI will give special attention to contributions dealing with breeds and procedures capable of contributing to the sustainable intensification of the world's medium to low input production environments (agro-ecosystems), which account for the substantial majority of the land area involved in livestock production; the total production of food and agriculture from livestock; and of our remaining farm animal genetic resources.

Views expressed in the paper published in AGRI represent the opinions of the author(s) and do not necessarily reflect those of the institutions which the authors are affiliated, FAO or the Editors.

The suitability of manuscripts for publication in AGRI is judged by the Editors and reviewers.

Electronic publication

AGRI is available in full electronically on the Internet, in addition to being published in hard copy, at:
<< <http://www.fao.org/dad-is>>>

Types of Articles

The following types of articles are published in AGRI.

Research articles

Findings of work on characterization, conservation and utilization of farm animal genetic resources (AnGR) in well described production environments, will be considered for publication in AGRI. Quality photographs of these genetic resources viewed in the primary production environment to which they are adapted, accompanying the manuscripts are encouraged.

Review articles

Unsolicited articles reviewing agro-ecosystems, country-level, regional or global developments on one or more aspects of the management of animal genetic resources, including state-of-the-art review articles on specific fields in AnGR, will be considered for publication in AGRI.

Position papers

Solicited papers on topical issues will also be published as deemed required.

Other published material

This includes book reviews, news and notes covering relevant meetings, training courses and major national, regional and international events and conclusions and recommendations associated with the outcomes of these major events. Readers are encouraged to send such items to the editors.

Guidelines for Authors

Manuscript submission

Manuscripts prepared in English, French or Spanish with an English summary and

another summary in either French or Spanish, should be submitted to AGRI Editor, AGAP, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy. Alternatively a manuscript may be sent as a WinWord Electronic Mail attachment to < agri@fao.org >. Photographs, coloured or black and white, and figures must be always sent by mail.

Manuscripts should be typed double-spaced and with lines numbered in the left margin. All pages, including those of references, tables etc., must be consecutively numbered. The corresponding author is notified of the receipt of a manuscript.

For manuscripts that are accepted after revision, authors are encouraged to submit a last version (3½" disc format) in Word 6.0 for Windows of their revised manuscript along with the printed copy.

Preparation of the manuscript

The first page of the manuscript must include the running head (abbreviated title), title, names of authors, institutions, full addresses including postal codes and telephone number and other communication details (fax, e-mail, etc.) of the corresponding author. The running head not exceeding 45 characters plus spaces, should appear at the top of page 1 of the manuscript entirely in capital letters. The title of the manuscript is typed in upper and lower case letters. The title should be as brief as possible not exceeding 150 characters (including spaces) with species names when applicable. Authors, institutions and addresses are in upper and lower case italics. There is one blank line between the title and the authors. Addresses are typed as footnotes to the authors after leaving one blank line. Footnotes are designated numerically. Two lines are left below the footnotes.

Headings

Headings of sections, for example Summary, Introduction, etc., are left-justified. Leave two blank lines between addresses footnotes and Summary and between the heading Summary and its text. Summary should not exceed 200

words . It should be an objective summary briefly describing the procedures and findings and not simply stating that the study was carried on such and such and results are presented, etc. Leave one line between the summary text and Keywords which is written in italics as well as the keywords themselves. All headings of sections (14 regular) and sub-sections (12 regular) are typed bold and preceded and succeeded by one blank line and their text begins with no indentation. The heading of a sub-subsection is written in italics, and ends with a dot after which the text follows on the same line. Keywords come immediately after the summaries. They should be no more than six, with no "and" or "&".

Tables and figures

Tables and figures must be enclosed with the paper and attached at the end of the text according their citation in the document. Photos will not be returned

Tables

Tables, including footnotes, should be preceded and succeeded by 2 blank lines. Table number and caption are written, above the table, in italics (12) followed by a dot, then one blank line. For each column or line title or sub-title, only the 1st letter of the 1st word is capitalized. Tables should be numbered consecutively in Arabic numerals. Tables and captions should be left justified as is the text. Use horizontal or vertical lines only when necessary. Do not use tabs or space-bar to create a table but only the appropriate commands.

Figures

Figures including titles and legends should be preceded and succeeded by two blank lines. Figure number and title are written, below the figure, in italics (12) and end with a dot. The term figures includes photos, line drawings, maps, diagrams etc.

All the submitted diagrams, must be

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accompanied with the original matrix of the data used to create them. It is strongly advised to submit diagrams in Word 6.0 or Excel 5.0. Figures should be numbered consecutively in Arabic numerals.

References

Every reference cited in the text should be included in the reference list and every reference in the reference list should have been mentioned in the text at least once. References should be ordered firstly alphabetically by the first author's surname and secondly by year.

Example for reference in a periodical is:

Köhler-Rollefson, I., 1992; The camel breeds of India in social and historical perspective. *Animal Genetic Resources Information* 10, 53-64.

When there are more than one author:

Matos, C.A.P., D.L. Thomas, D. Gianola, R.J. Tempelman & L.D. Young, 1997; Genetic analysis of discrete reproductive traits in

sheep using linear and nonnlinear models: 1. Estimation of genetic parameters 75, 76-87.

For a book or an ad hoc publication, e.g., reports, theses, etc.:

Cockril, W.R., (Ed), 1994; *The Husbandry and Health of the Domestic Buffalo*. FAO, Rome, Italy, pp 993.

For an article in the proceedings of a meeting:

Hammond, K., 1996; FAO's programme for the management of farm animal genetic resources. In C. Devendra (Ed.) *Proceedings of IGA/FAO Round Table on the Global Management of Small Ruminant Genetic Resources*, Beijing, May 1996, FAO, Bangkok, Thailand, 4-13.

Where information included in the article has been obtained or derived from a World Wide Web site, then quote in the text, e.g. "derived from FAO. 1996" and in the References quote the URL standard form:

FAO, 1996; *Domestic Animal Diversity Information System* <<http://www.fao.org/dad-is/>>, FAO, Rome

.....

Normes et règles éditoriales

L'objectif du Bulletin d'Information sur les Ressources Génétiques Animales (AGRI) est la vulgarisation de l'information disponible sur la meilleure gestion des ressources génétiques animales d'intérêt pour la production alimentaire et agricole, d'après les recommandations de la Stratégie Mondiale pour la Gestion des Ressources Génétiques des Animaux Domestiques. Tous les aspects relatifs à la caractérisation, la conservation et l'utilisation de ces ressources seront pris en considération, suivant les normes de la Convention pour la Biodiversité.

AGRI désire diffuser de l'information sur la génétique, les enquêtes phénotypiques et économiques et les descriptions comparatives, l'utilisation et la conservation des ressources génétiques animales, ainsi que toute information sur le développement de stratégies opérationnelles et de normes qui puissent permettre une meilleure gestion de la relation coût/efficacité. C'est pour cela que AGRI prendra spécialement en considération toutes les contributions référées aux races et aux normes capables de permettre une intensification durable des milieux (agroécosystèmes) à revenus moyens et bas dans le monde; qui comprennent la majeure partie des terres consacrées à l'élevage, à la production totale des aliments et l'agriculture provenant de l'élevage; et tout ce qui reste comme ressources génétiques des animaux domestiques.

Les opinions exprimées dans les articles publiés dans AGRI appartiennent seulement aux auteurs et donc ne représentent pas nécessairement l'opinion des instituts pour lesquels ils travaillent, la FAO ou les éditeurs.

L'opportunité ou non de publier un article dans AGRI sera jugée par les éditeurs et les réviseurs.

Publication électronique

En plus de sa version imprimée, la version totale de AGRI se trouve disponible sur Internet, sur le site:

<<<http://www.fao.org/dad-is/>>>

Types d'articles

Les articles suivants pourront être publiés sur AGRI:

Articles de recherche

Seront prises en considération pour leur publication sur AGRI les études sur la caractérisation, la conservation et l'utilisation des ressources génétiques des animaux domestiques (AnGR) accompagnées d'une bonne description du milieu. On encourage les auteurs à envoyer des photographies de bonne qualité qui montrent les races en question dans leur milieu naturel de production.

Révisions

Occasionnellement, des articles contenant une révision des agroécosystèmes, au niveau national, régional ou mondial, avec un ou plusieurs aspects se rapportant à la gestion des ressources génétiques animales, y comprises les mises à jour des différentes zones de AnGR, seront pris en considération.

Articles spécifiques

Ponctuellement, des articles sur des thèmes spécifiques pourront être demandés pour la publication d'éditions spéciales.

Autre matériel pour publication

Ceci comprend la révision de livres, nouvelles et notes de réunions importantes, cours de formation et principaux événements nationaux, régionaux et internationaux; ainsi que les conclusions et recommandations par rapport aux objectifs de ces principaux événements. Les auteurs sont priés d'envoyer ce genre de matériel aux éditeurs.

Guide pour les auteurs

Présentation du manuscrit

Les articles se présenteront en anglais, français ou espagnol, avec un résumé en anglais et sa traduction en français ou en espagnol; et seront envoyés à l'éditeur de AGRI, AGAP, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italie. L'autre possibilité est d'envoyer l'article par courrier électronique avec le document adjoint en version WinWord à <agri@fao.org>. Les photographies, en couleur ou en blanc et noir, seront toujours envoyées par courrier normal.

Les manuscrits se présenteront à double interligne et avec le numéro correspondant à chaque ligne sur la marge gauche. Toutes les pages seront numérotées, y comprises celles avec les références bibliographiques, les tableaux, etc. L'auteur recevra une lettre lui donnant bonne réception de son document.

Lorsqu'un article, après sa révision, sera accepté, on demandera à l'auteur d'envoyer la version finale révisée sur disquette (format 3 1/2") en Word 6.0 x Windows, ainsi qu'une copie sur papier.

Préparation du manuscrit

Sur la première page du manuscrit on indiquera le titre de l'article en abrégé, le titre et noms des auteurs, des institutions, les adresses complètes (y compris code postal et numéro de téléphone); ainsi que tout autre moyen de contact tel que fax, e-mail, etc. avec l'auteur principal. Le titre abrégé ne devra pas dépasser les 45 caractères, plus les espaces nécessaires, et s'écrira sur la partie supérieure de la page 1 du manuscrit en majuscules. Le titre en entier du manuscrit sera écrit en majuscules et minuscules; il devra être aussi bref que possible, sans dépasser les 150 caractères (y compris les espaces nécessaires), et avec l'indication des noms des espèces. Les noms des auteurs, des institutions et les adresses seront en italique et en lettres majuscules et minuscules. On laissera un espace en blanc entre le titre et les noms des auteurs. Les adresses seront indiquées comme

des notes à pied de page pour chacun des auteurs après avoir laissé un espace en blanc après les noms. Chaque note de pied de page sera numérotée. On laissera deux espaces en blanc après les adresses.

Titres

Les titres de chaque chapitre, par exemple Résumé, Introduction, etc. seront alignés à gauche. Laisser deux espaces en blanc entre les notes de pied de page avec les adresses et le Résumé, et entre le titre Résumé et le texte qui suit. Le résumé ne devra pas dépasser les 200 mots. Il s'agira d'un résumé objectif qui fasse une brève description des processus utilisés et des résultats obtenus, et non pas une simple présentation du travail réalisé avec une description générale des résultats. Laisser un espace en blanc entre la fin du texte du résumé et les mots-clés, qui seront écrits en italique ainsi que le titre Mots-clés. Les mots-clés seront au maximum six et il ne devra pas y avoir de "et" ou "&". Tous les titres principaux de chapitre (14 regular) et sous-chapitre (12 regular) seront en gras avec un espace en blanc avant et après. Le texte commencera sans retrait. Un titre à l'intérieur d'un sous-chapitre s'écrira en italique, suivi d'un point, avec le texte à continuation.

Tableaux et figures

Les tableaux et les figures iront à la fin du texte en suivant l'ordre d'apparition dans le texte. Les photographies ne seront pas dévolues aux auteurs.

Tableaux

Les tableaux, y compris les notes de pied de page, devront avoir un espace en blanc avant et après. Le numéro du tableau et le titre s'écriront sur la partie supérieure en italique (12) avec un point à la fin et un espace en blanc en dessous. Sur chaque colonne, titre d'en-tête ou sous-titre, seulement la première lettre du premier mot sera en majuscule. Les tableaux et leur titre seront alignés à gauche, ainsi que le texte. Les lignes verticales et

horizontales seront utilisées seulement si nécessaires. Ne pas utiliser les tabs ou la barre de séparation pour créer un tableau.

Figures

Les figures, y compris les titres et les légendes, seront précédés et suivis de deux espaces en blanc. Le numéro de la figure et le titre s'écriront sur la partie supérieure en italique (12) avec un point à la fin. Sous la rubrique figure on trouvera les photographies, les graphiques, les cartes, les diagrammes, etc. Dans le cas des diagrammes, la matrice originale avec les données utilisées pour son élaboration devra être envoyée. On recommande l'utilisation de Word 6.0 ou Excel 5.0 pour la présentation des diagrammes.

Références

Toute référence présente dans le texte devra apparaître sur la liste des références, et chaque référence de la liste aura été citée au moins une fois dans le texte. Les références iront en ordre alphabétique du nom de l'auteur, suivi de l'année. Exemple dans le cas d'une référence sur une revue:

Köhler-Rollefson, I., 1992; The camel breeds of India in social and historical perspective. *Animal Genetic Resources Information* 10, 53-64.

Lorsqu'il s'agit de plus d'un auteur:

Matos, C.A.P., D.L. Thomas, D. Gianola, R.J. Tempelman & L.D. Young, 1997; Genetic analysis of discrete reproductive traits in sheep using linear and nonnlinear models: 1. Estimation of genetic parameters 75, 76-87.

Dans le cas d'un livre ou d'une publication ad hoc, par exemple un rapport, une thèse, etc.:

Cockril, W.R., (Ed), 1994; *The Husbandry and Health of the Domestic Buffalo*. FAO, Rome, Italy, pp 993.

S'il s'agit d'un acte d'une réunion:

Hammond, K., 1996; FAO's programme for the management of farm animal genetic resources. In C. Devendra (Ed.) *Proceedings of IGA/FAO Round Table on the Global Management of Small Ruminant Genetic Resources*, Beijing, May 1996, FAO, Bangkok, Thailand, 4-13.

Lorsque l'information contenue dans l'article ait été obtenue ou dérive d'un site World Wide Web, il faudra mettre le texte entre guillemets; par exemple "tiré de la FAO. 1996" et indiquer dans les Références la forme standard URL:

FAO, 1996; Domestic Animal Diversity Information System <<http://www.fao.org/dad-is/>>, FAO, Rome

Reglas y normas editoriales

El objetivo del Boletín de Información sobre Recursos Genéticos Animales (AGRI) es la divulgación de la información sobre una mejor gestión de los recursos genéticos animales de interés para la producción alimentaria y agrícola, siguiendo la Estrategia Mundial para la Gestión de los Recursos Genéticos de los Animales Domésticos. Todos los aspectos referidos a la caracterización, la conservación y el uso de estos recursos serán tomados en consideración, de acuerdo con la Convención sobre la Biodiversidad.

AGRI publicará información sobre genética, encuestas fenotípicas y económicas y descripciones comparativas, uso, desarrollo y conservación de los recursos genéticos animales, así como sobre el desarrollo de estrategias operacionales y normas que permitan una gestión más eficaz de la relación costo/eficacia. Por ello, AGRI prestará especial atención a las contribuciones referidas a razas y normas capaces de contribuir a la intensificación sostenible de los medios (agroecosistemas) con ingresos medio y bajos en el mundo, que comprenden casi la mayor parte de las tierras dedicadas a la producción ganadera; la producción total de alimentos y agricultura provenientes de la ganadería; y el resto de los recursos genéticos de animales domésticos.

Los puntos de vista expresados en los artículos publicados en AGRI son solamente las opiniones de los autores y, por tanto, no reflejan necesariamente la opinión de las instituciones para las cuales trabajan dichos autores, de la FAO o de los editores.

La oportunidad o no de publicar un artículo en AGRI será juzgada por los editores y revisores.

Publicación electrónica

Además de su publicación impresa, la versión íntegra de AGRI se encuentra disponible electrónicamente sobre Internet, en el sitio: <<<http://www.fao.org/dad-is/>>>

Tipos de artículos

Serán publicados en AGRI los siguientes tipos de artículos:

Artículos sobre investigación

Se tomarán en consideración para su publicación en AGRI los estudios sobre la caracterización, conservación y uso de los recursos genéticos de los animales domésticos (AnGR) con una buena descripción del entorno. Se agradecerá el envío de fotografías de calidad que presenten a las razas en cuestión en su ambiente natural de producción.

Artículos de revisión

Se podrán tener en consideración ocasionalmente aquellos artículos que presenten una revisión de los agroecosistemas, a nivel nacional, regional o mundial, con el desarrollo de uno o más aspectos referidos a la gestión de los recursos genéticos animales, incluidas las revisiones sobre el estado actual de las distintas áreas de AnGR.

Artículos específicos

Se solicitarán puntualmente artículos sobre temas específicos para ediciones especiales.

Otro material para publicación

Incluye la revisión de libros, noticias y notas referidas a reuniones importantes, cursos de formación y principales eventos nacionales, regionales e internacionales, así como conclusiones y recomendaciones relacionadas con los objetivos de estos principales eventos. Se invita a los lectores a enviar este tipo de material a los editores.

Guía para los autores

Presentación del manuscrito

Los artículos se presentarán en inglés, francés o español, junto con un resumen en inglés y su traducción en francés o español, y se enviarán al editor de AGRI, AGAP, FAO, Viale delle Terme di Caracalla, 00100 Roma, Italia. Otra posibilidad es enviar el artículo por correo electrónico adjuntando el documento en versión WinWord a <agri@fao.org>. Las fotografías, a color o en blanco y negro, se enviarán siempre por correo normal.

Los manuscritos se presentarán con doble espacio y con el número correspondiente a cada línea en el margen izquierdo. Todas las páginas serán numeradas, incluidas las de las referencias bibliográficas, cuadros, etc. El autor recibirá una notificación sobre la recepción de su documento.

En el caso de aceptación de un artículo después de su revisión, se solicitará al autor una versión final de su artículo revisado en disquete (formato 3¹/₂" en Word 6.0 x Windows, así como una copia impresa del mismo.

Preparación del manuscrito

En la primera página del manuscrito se indicará el título abreviado del artículo, títulos y nombres de los autores, instituciones, direcciones completas (incluido código postal y número de teléfono); así como otros medios de contacto tales como fax, e-mail, etc., del autor principal. El título abreviado no deberá sobrepasar los 45 caracteres más los espacios correspondientes, y aparecerá en la parte superior de la página 1 del manuscrito en mayúsculas. El título entero del manuscrito viene escrito en mayúsculas y minúsculas. Dicho título debe ser lo más breve posible y no sobrepasar los 150 caracteres (incluidos los espacios necesarios), con los nombres de las especies, si necesario. Los nombres de los autores, instituciones y direcciones se escribirán en cursiva y en letras mayúsculas y minúsculas. Se dejará una línea en blanco

entre el título y los nombres de los autores. Las direcciones se escribirán como notas de pie de página de cada autor después de dejar una línea en blanco entre los nombres y éstas. Cada nota de pie de página con la dirección vendrá indicada numéricamente. Se dejarán dos líneas en blanco después de las direcciones.

Títulos

Los títulos de cada sección, por ejemplo Resumen, Introducción, etc., vienen alineados a la izquierda. Dejar dos líneas en blanco entre las notas de pie de página con las direcciones y el Resumen y entre el título Resumen y el texto que sigue. El resumen no deberá exceder de 200 palabras. Deberá ser un resumen objetivo que describa brevemente los procesos y logros obtenidos, y no una presentación de cómo se ha llevado a cabo el estudio y una descripción genérica de los resultados. Dejar una línea en blanco entre el final del texto del resumen y las palabras clave, que se escribirán en cursiva así como el título Palabras clave. No deberán ser más de seis y no deberán contener "y" o "&". Todos los títulos principales de capítulo (14 regular) y subcapítulo (12 regular) serán en negrita e irán precedidos y seguidos de una línea en blanco. El texto correspondiente empezará sin sangrado. Un título dentro de un subcapítulo se escribirá en cursiva e ira seguido de un punto con a continuación el texto correspondiente.

Cuadros y figuras

Los cuadros y las figuras se incluirán al final del texto siguiendo el orden de cita dentro del mismo. Las fotografías no serán devueltas a sus autores.

Cuadros

Los cuadros, incluidas las notas de pie de página, deberán ir precedidos y seguidos por dos líneas en blanco. El número del cuadro y su título se escribirán en la parte superior en cursiva (12) con un punto al final y seguido

de una línea en blanco. En cada columna o título de encabezamiento o subtítulo, sólo la primera letra de la primera palabra irá en mayúscula. Los cuadros irán numerados de forma consecutiva con números árabes. Los cuadros y sus títulos se alinearán a la izquierda, así como el texto. Se utilizarán líneas horizontales o verticales sólo cuando sea necesario. No utilizar tabuladores o la barra espaciadora para crear un cuadro.

Figuras

Las figuras, incluidos los títulos y leyendas, irán precedidas y seguidas de dos líneas en blanco. El número de la figura y el título se escribirán en la parte superior en cursiva (12) con un punto al final. La palabra figura incluye las fotografías, los gráficos, los mapas, los diagramas, etc. En el caso del diagrama se enviará la matriz original con los datos utilizados para crearlo. Se recomienda encarecidamente la utilización de Word 6.0 o Excel 5.0 para la presentación de los diagramas.

Referencias

Toda referencia presente en el texto deberá aparecer en la lista de referencias y, de la misma manera, cada referencia de la lista deberá haber sido citada por lo menos una vez en el texto. Las referencias deben ir en orden alfabético del apellido del autor, seguido por el año.

Ejemplo en el caso de una referencia de una revista:

Köhler-Rollefson, I., 1992; The camel breeds of India in social and historical perspective. *Animal Genetic Resources Information* 10, 53-64.

Cuando se trata de más de un autor:

Matos, C.A.P., D.L. Thomas, D. Gianola, R.J. Tempelman & L.D. Young, 1997; Genetic analysis of discrete reproductive traits in sheep using linear and nonlinear models: 1. Estimation of genetic parameters 75, 76-87.

En el caso de un libro o de una publicación ad hoc, por ejemplo informes, tesis, etc.:

Cockril, W.R., (Ed), 1994; *The Husbandry and Health of the Domestic Buffalo*. FAO, Rome, Italy, pp 993.

Cuando se trate de un artículo dentro de las actas de una reunión:

Hammond, K., 1996; FAO's programme for the management of farm animal genetic resources. In C. Devendra (Ed.) *Proceedings of IGA/FAO Round Table on the Global Management of Small Ruminant Genetic Resources*, Beijing, May 1996, FAO, Bangkok, Thailand, 4-13.

Cuando la información contenida en el artículo haya sido obtenida o derive de un sitio World Wide Web, poner el texto entre comillas; por ejemplo "sacado de la FAO. 1996" e indicar en las Referencias la forma estándar URL:

FAO, 1996; Domestic Animal Diversity Information System <<http://www.fao.org/dad-is/>>, FAO, Rome

