RESEARCH PROGRAM ON Livestock

CGIAR

More meat, milk and eggs by and for the poor

Guidelines on Institutional and Technical Certification of Breeding Rams in Ethiopia

Rekik, M.,[1] Haile, A.,[2] Rischkowsky, B.,[2] Getachew, G.,[2] Wieland, B.,[3]

Authors affiliation

1. International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 950764, Amman 11195, Jordan
2. International Centre for Agricultural Research in the Dry Areas, Addis Ababa, Ethiopia. P.O. Box 5689
3. International Livestock Research Institute, P.O. Box 5689, Addis Ababa, Ethiopia

ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

ICARDA Science for resilient livelihoods in dry areas

CIAT International Center for Tropical Agriculture Since 1967 Science to cultivate change

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

SLU

CGIAR is a global partnership that unites organizations engaged in research for a food-secure future. The CGIAR Research Program on Livestock provides research-based solutions to help smallholder farmers, pastoralists and agro-pastoralists transition to sustainable, resilient livelihoods and to productive enterprises that will help feed future generations. It aims to increase the productivity and profitability of livestock agri-food systems in sustainable ways, making meat, milk and eggs more available and affordable across the developing world. The Program brings together five core partners: the International Livestock Research Institute (ILRI) with a mandate on livestock; the International Center for Tropical Agriculture (CIAT), which works on forages; the International Center for Research in the Dry Areas (ICARDA), which works on small ruminants and dryland systems; the Swedish University of Agricultural Sciences (SLU) with expertise particularly in animal health and genetics and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) which connects research into development and innovation and scaling processes.

The Program thanks all donors and organizations who globally supported its work through their contributions to the CGIAR system.

Editing, design and layout (ICARDA)

Cover photo — Community-selected ram in Bonga (photo credit: ICARDA).

Citation: *Rekik, M., Haile, A., Rischkowsky, B., Getachew, T.. Wieland, B.* 2018. Guidelines on Institutional and Technical Certification of Breeding Rams in Ethiopia. ICARDA (Tools and Guidelines). Addis Ababa, Ethiopia: ICARDA.

Patron: Professor Peter C Doherty AC, FAA, FRS
Animal scientist, Nobel Prize Laureate for Physiology or Medicine–1996

Box 30709, Nairobi 00100 Kenya
Phone +254 20 422 3000
Fax +254 20 422 3001
Email ilri-kenya@cgiar.org

ilri.org
better lives through livestock

ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia
Phone +251 11 617 2000
Fax +251 11 667 6923
Email ilri-ethiopia@cgiar.org

ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa

Table of Contents

Guidelines on Institutional and Technical Certification of Breeding Rams in Ethiopia

In livestock production, animals are certified to fit to a particular purpose. Certified animals and sires in particular, have added value that will have an impact on the herds and should result in a monetary advantage. In addition to their breeding value for economically-important traits (growth, milk, reproductive efficiency…) and therefore the superiority of their performances, certified sires should be healthy (ideally disease-free) with a good libido and be fertile.

1. Purpose

In the framework of the community-based breeding programs (CBBP's) for sheep in Ethiopia, which have been adopted as the preferred approach for sheep breeding in the country, sire certification is intended to reduce the risk of communities using potentially unsuitable rams for breeding. Furthermore, the certification process would empower the communities producing genetics to be more competitive in the market for sires. These Guidelines aim to support the official services of the Ministry of Agriculture in Ethiopia in establishing an institutional and technical certification process for rams selected from the existing CBBP's across the country. The certification would be employed prior to rams' dissemination for use in natural mating or artificial insemination. The objectives of these guidelines are:

- ✓ To propose an institutional arrangement for the certification process of selected rams in the framework of CBBP's;
- ✓ To describe the technical requirements of the certification process;
- ✓ To provide, in annex, detailed templates to record the observations emanating from the field-based technical certification assessment.

2. Scope

These guidelines apply to all rams selected in the framework of CBBP's that satisfy at least one of the following criteria:

- ➢ Rams selected in the framework of research for development projects implemented by the International Center for Agricultural Research in the Dry Areas (ICARDA) and its partners Agricultural Research Institutes;
- ➢ Rams selected in the framework of sheep breeding programs supported by the federal and regional research systems in Ethiopia;
- ➢ Rams selected in the framework of sheep breeding programs supported by the national programs of the Ministry of Agriculture.

Rams' certification is a requirement under the following one or more reason for examination:

- Pre-sale check from the community to farmers members of the CBBP's or between farmers members of the CBBP; the certification in this situation represents a guarantee for the buyer with regards the quality and the potential of the purchased animal;
- Pre-breeding use by the community or farmers within the CBBP flocks; this scenario is the most frequent case where certification will be needed and required. It ensures that every single ram used to sire females enrolled in the breeding program has been certified for its breeding value, reproductive ability and is not a carrier of sexually-transmitted diseases;
- Insurance purposes. Breeding rams have a higher economic value than market lambs. In case an insurance policy for high-value livestock animals becomes available, then the certification documents would become a requirement to show to the contracting insurance agent.

Levels of technical certification under these different reasons for examination may not be necessarily the same and may involve different requirements and tests.

3. Principles

3.1. Breeding programs framework

In all what follows breeding rams refer to rams of Ethiopian sheep breeds selected in the framework of CBBP's. They correspond to identified rams (ear-tags or any other official identification means), of known pedigree and classified, then selected among other counterpart rams based on their breeding value and phenotype description. According to the breed and the agreed breeding objectives with the community, every single ram should have an estimated breeding value (EBV) for the desired trait (six-month EBV, litter size EBV, milk production EBV…). Pre-breeding certification of such rams should occur when they are first selected at an approximate age of 06 months and preferably at yearly intervals afterwards or prior to major mating seasons for the breed or artificial insemination campaigns.

3.2. Major technical requirements

Technical requirements for certification include (i) Physical examination; (ii) Semen examination; (iii) Assessment of mating ability and (iv) Certificate of vaccination against known reproductive diseases.

3.3. On-farm data collection form

An on-farm data collection form to record observations from levels (i), (ii) and (iii) of examinations is provided in Annex 1. Forms should have the official logo of the Ministry of Agriculture and should be completed by a trustworthy official agent. The form should be duly filled, signed and dated.

3.3. Suitability for breeding

Animals are classified as "Suitable for Breeding" based on meeting the requirements of (i); (i and ii); (i, ii and iii); (i, ii, iii and iv) or "Unsuitable for Breeding".

3.4. Competence requirements

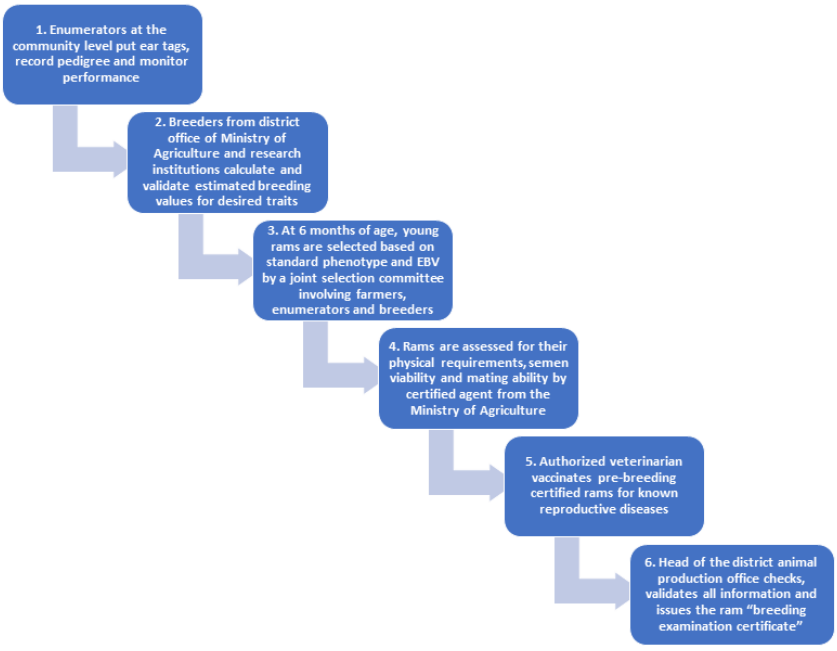
Examinations falling under requirements (i), (ii) and (iii) can be performed by a certified animal production technician, veterinarian or paramedic in veterinary medicine affiliated to an Agricultural Research Institute, Regional Extension or Animal Health Services under the authority of the Ministry of Agriculture. The certificate of vaccination should be signed by an authorized veterinarian of the public animal health services or a registered private practitioner.

3.5. Official certification

Official certification of the rams should be approved and signed by the head of the animal production office of the district where the breeding program operates. Only after the primary certification at the approximate age of 6 months, can selected rams be used for natural mating or artificial insemination. A prototype of the pre-breeding examination certificate is provided in Annex 2.

3.6. Certification process

The certification process comprises 6 steps at the end of which a breeding examination certificate is issued by the competent authorities of the Ministry of Agriculture at the district level. The certification process is a cascade of action and events initiated at the flock level as early as the birth of the potential future rams



Annex 1. Ram Pre-Breeding Examination: On-farm Data Collection Form

Vet/Examiner	Farmer/community	Date

There should be a tick, measurement, comment, or 'NE' (not-examined) in each white box.

Ear tag/tattoo/ID		Ram 1:		Ram 2:		Ram 3:	
Breed/Estimated breeding value							
Date of birth/Age (months)							
BCS (out of 5)							
If normal, then write N. If abnormal then describe e.g small, enlarged, soft, hard, lumpy, swollen…	Teeth						
	Feet						
	Rest of body						
	Brisket						
	Prepuce						
	Penis						
	Scrotum						
	Testicles size	L	R	L	R	L	R
	Epididymis head	L	R	L	R	L	R
	Epididymis tail	L	R	L	R	L	R
Scrotal circumference (cm)							
Semen collection method		1st collection AV / EEJ	2nd collection AV / EEJ	1st collection AV / EEJ	2nd collection AV / EEJ	1st collection AV / EEJ	2nd collection AV / EEJ
Volume	(ml)						
Gross density 0 (clear) -5 (double creamy)							
Gross motility/ wave motion (0-5)							
Mating ability							

Physical examination - A basic clinical examination should always be undertaken. If there are no abnormalities detected then the relevant box can be ticked. If there is an abnormality, a comment should be inserted. If that aspect was not examined, insert 'NE'.

Body condition score

Should be assessed on a 1-5 scale where 1 is very thin and 5 is obese. Rams in very thin body condition score, 2 or less, should be classified as unsatisfactory. Score 1: Spine prominent and sharp, fingers easily pass under horizontal processes (HP). ***Too thin, possibly diseased.*** Score 2: Spine prominent and smooth, fingers go under with pressure. ***Too thin, needs supplementary feeding.*** Score 3: Spine smooth and rounded, fingers need pressure to find ends. ***Optimum condition for mating.*** Score 4: Spine detected as a line, HP are not felt. ***Overfat.*** Score 5: Spine not detectable, fat dimpled over spline, HP not detectable. ***Grossly overfat, mating ability compromised.***

Eyes, nose and mouth

Rams should be inspected for severe over or undershot jaw and gross defects, which may interfere with vision and the ability to seek out females. Eyes: should be checked for any abnormality: presence of ocular lesion, anemia (pale conjunctiva), icterus (yellowish conjunctiva) or any eye discharge. Nose: should be slightly humid with no discharge of any type. Its movements should be regular and not very perceptible. Mouth should look normal with no symptoms of hyperkeratosis, any pustules or crusty lesions. Rams with several broken teeth or abnormal dentition causing difficulties in mastication should also be culled. This is particularly important for rams grazing dry, gross material.

Conformation and limb soundness

Rams should be inspected for evidence of lameness whilst walking on a smooth level surface. Lame rams or rams with severe limb defects e.g. valgus deformity or elbow arthritis should be classified as unsatisfactory in section 1.

Feet

Rams should have normal feet and legs for good standing positions during mating. Rams with lameness, foot rot, foot abscess, inter-digital growths or with non-trimmed hooves should be promptly treated or classified unsatisfactory in section 1.

External genitalia

The scrotum and contents should be carefully palpated. Rams with gross physical abnormalities such as epididymitis or orchitis would be classed unsatisfactory in section 1. Testicles should have the same size (symmetric) and move freely inside the scrotal bag; their mass should be firm, but not hard, with no indication of abscesses, injuries or any other condition. Rams with only one testicle (monorchid) are sub-fertile and should not be kept for breeding even if you like their conformation and sexual aggressiveness.

Penis and prepuce

The examination is best carried out when restraining the ram at its rump. The penis and prepuce should be examined to determine if there are indications of adhesion, pizzle rot (unhealthy combination of urine scald and bacterial growth on the prepuce) or any injury. Special attention should be paid to the preputial orifice for ulceration or inflammation. There should be no adhesions to the sheath or any signs of lesions of the gland, pus and abscesses.

Scrotal circumference

All measurements to be made in cm at the widest point of the scrotum with a tensioned measuring tape

Equipment - All laboratory vessels/slides used to handle semen should be warmed prior to use to 30-37^{o}C & the microscope stage kept at 35-37 ^{o}C. AV: artificial vagina; EEJ: Electro-ejaculator

Semen volume should be measured by a direct reading in a collection tube graduated to the nearest 0.1 ml.

Gross density is not relevant when a sample is collected by electro-ejaculator. However, a figure should be given in all cases following assessment of the sample made by the naked eye.

0	1	2	3	4	5
Clear	**Cloudy watery**	**Thin milky**	**Milky**	**Creamy**	**Double creamy**

Gross motility should be assessed as a drop of semen is placed on a slide and viewed under low magnification (x10) using a phase-contrast microscope.

0	1	2	3	4	5
Dead	**No waves (very poor)**	**Very slow waves (poor)**	**Slow distinct waves (fair)**	**Fast waves (good)**	**Rapid dense waves (very good)**
No sperm or all dead	Some movement at edge of drop	~20-40% live sperm	~45-65% live sperm	~70-85% live sperm	~90% live sperm

ASSESSMENT OF MATING ABILITY

Libido is difficult to assess and define, so this part of the examination simply confirms whether the vet/examiner has observed normal service behaviour and intromission when the ram was presented with females in oestrus.

At least one successful service within 10 minutes of being presented to in-oestrous female should be expected. If this part of the examination is not carried out, then rams can still be classified as SUITABLE FOR BREEDING based on meeting the requirements of parts 1 and 2 only. The owner/purchaser is invited to observe the ram closely at the start of breeding period to monitor libido and mating ability

Alternatively, a formal libido test can be performed when the ram is placed with 2 females in oestrus for 10 minutes and observations on Latency to first reaction (s), Total activity time (min), Vulva sniffing, Flehmen, Lateral approaches and Mount attempts are recorded and quantified.

Suggested references:

Allan, S. 2010. Foot abscess in sheep. Primefact, 987: January 2010
Mozo et al. 2015. Evaluating the reproductive ability of breeding rams in North-Eastern Spain using clinical examination of the body and external genitalia. BMC Veterinary Research, 11: 289
Plant, J.W., Seaman, J. 2007. Ovine brucellosis. Primefact, 472: June 2007.
Vipond, J., Morgan, C. 2008. Ram management and purchase. Scottish Agricultural College.
http://www.sruc.ac.uk/info/120109/beef_and_sheep_services/764/ram_management_and_purchase

Annex 2. Ram Pre-Breeding Examination Certificate

Date of Examination: _____

Owner	
Address	

RAM	Ear tag:
	Breed:
	Date of birth/age:

1. Physical examination

Body condition score (1-5)		
	NAD	Abnormal
Eyes, nose and mouth	O	O
Conformation and limb soundness	O	O
Feet	O	O
External genitalia	O	O
Scrotal circumference		cm

Overall results:
SATISFACTORY* / UNSATISFACTORY*

*NAD = No Abnormality detected, *delete as required*

2. Semen examination

Collection method	AV*	EEJ **
Appearance/density	/5	
Gross motility	/5	

Overall results: SATISFACTORY* / UNSATISFACTORY*

*AV: Artificial vagina; ** EEJ: Electro-ejaculator

3. Assessment of mating ability and libido (tick as appropriate)

This ram has been observed exhibiting normal service behavior and mating ability

This ram has not been observed exhibiting normal service behavior and mating ability

4. Classification	
SUITABLE FOR BREEDING	based on meeting the requirements of section 1 only
SUITABLE FOR BREEDING	based on meeting the requirements of section 1 and 2 only
SUITABLE FOR BREEDING	based on meeting the requirements of section 1, 2 and 3
UNSUITABLE FOR BREEDING	

Name of District-Head Animal Production Office	
Date	
Certificate No	
Signature and stamp	

Important: This certificate should be accompanied by a vaccination certificate against known reproductive diseases.