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Review of the Reproductive Performances of Indigenous Sheep in Ethiopia

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Abstract
Ethiopia's vast sheep and goat population, estimated at about 27.3 million and 28.2 million heads respectively, are highly adaptable to a broad range of environments and classified based on their morphological characteristics and geographic distribution into 14 sheep types/population. However, the annual meat production and off-take is very low as compared to the huge population and genetic source of country. Good reproductive performance is a prerequisite for any successful genetic improvement and it determines production efficiency which depends on various factors including age at first lambing, litter size, lambing interval and the life time productivity of the ewe, the last one being related to longevity. Characteristics of puberty for indigenous Ethiopian sheep was differ for the various sheep breeds and Age at puberty is impacted by genotype, the season of birth (for seasonal breeds), and plan of nutrition. Menz ewe lambs are capable of reaching puberty before 14 months and Menz, Horro and Afar ram lambs reaching puberty at 288±6,322.7 and 213 day's age and at puberty, SC averaged 23-23.5cm and 23-24cm for Menz and Horro rams.
Keywords; Ethiopia, Performance, indigenous, Reproductive, sheep

1. Introduction

Ethiopia's vast sheep population, estimated at about 29.33 million heads (CSA, 2014/15) are highly adaptable to a broad range of environments (Tsedeke, 2007), owned by smallholder farmers as an integral part of the livestock sub-sector (Workneh, 2000), and farmers keep small ruminants for trade and meat consumption in household where gross income is determined by the size of the flock number raised by the owners (Gemeda et al., 2007). The annual meat production from small ruminants 154,000 tons is relatively small as compared to the large number of animals 50 million (Mourad R,2015). The off-take is very low at 33% (EPA, 2002) with an average lamb carcass weight of 10kg (FAO, 2005). Recent estimates of average off-take rate, defined as the proportion of animals sold or consumed in a year, from sheep and goat herds between 2008 and 2010 were 30-38 percent (ILRI, 2014, unpublished report; cited by Mourad R et al, 2015). This is because sheep breeding in Ethiopia is non-controlled, and health and nutrition management are very poor (Tibbo, 2006).

The usefulness of characterization of the phenotypic and the genotype of the indigenous sheep breeds (types) is not in doubt. Thus, Different work had been done to characterize indigenous sheep breeds (types) in Ethiopia. According to Gizaw (2008) Ethiopian sheep are classified based on their morphological characteristics and geographic distribution into 14 sheep types/population. Identification of the breed is the base for different sheep breed improvement strategies and sheep productivity scheme. According to Devendra (1999) and Tibbo (2006) sheep and goats, with higher reproductive capacity and growth rates, are ideally suited to production by resource-poor smallholders. Reproductive and productive performances are important early indicators of adaptability and management adequacy (Abegaz et al, 2002; Getahun, 2008).Therefore, this review provide a knowledge of reproductive performances of sheep breeds/types in Ethiopia and will be helpful for further study.

2. Purpose of the review

There are numerous benefits of reviewing the current state of knowledge related to the reproductive performances of Ethiopian sheep.

First, to identify gaps in the current knowledge and determine future research priorities/problems. Being aware of past research which was done by other researchers.

Second, to identify gaps in the current research might encourage new investments in future research. Understanding existing knowledge or the lack of it is critical to those formulating new research topic.

3. Research Review

3.1 Sheep breeds in Ethiopia and their geographic distribution

Knowledge of the characteristics of a farm animal genetic resource (e.g., sheep, goat, cattle) is essential in managing the resource for optimum benefit. Farm animal resources are organized into 'breeds' that describe productive and adaptive characteristics of identified groups of animals (Gizaw, 2008).

According to Gizaw (2008) the sheep types in Ethiopia are classified into four major groups based on their physical characteristics: short fat-tailed, long fat- tailed, thin-tailed and fat-rumped sheep and also based on DNA differences, it has been classified into nine genetically distinct breeds as shown in table1.

Table 1. Major groups, breeds and sheep types of sheep in Ethiopia

Major group	Breed	Sheep types	Tail type/shape	Fiber type
Short-fat-tailed	Simien	Simien	Fatty and short	Wool/fleece
	Short fat-tailed	Sekota, Farta, Tikur, Wollo, Menz	Fatty and short	Wool/fleece
	Washera	Washera	Fatty and short	Short hair
Long-fat-tailed	Horro	Horro	Fatty and long	Short hair
	Arsi-Bale	Arsi-Bale, Adilo	Fatty and long	Short hair
	Bonga	Bonga	Fatty and long	Short hair
Fat-rumped sheep	Afar	Afar	Fat rump with fat tail	Short hair
	Black head Somali	Black head Somali	Fat rump/tiny tail	Short hair
Thin-tailed sheep	Gumz	Gumz	Thin and long	Short hair

According to Gizaw (2008), the geographical distribution of sheep breeds of Ethiopia is shown in Figure1 and its important distinguishing physical characteristics in figure2. This location map of the breeds/types can also indicates how indigenous sheep population of sheep in Ethiopia are highly adapted to their broad range of environment and different physical characteristics of sheep type are found in the country.

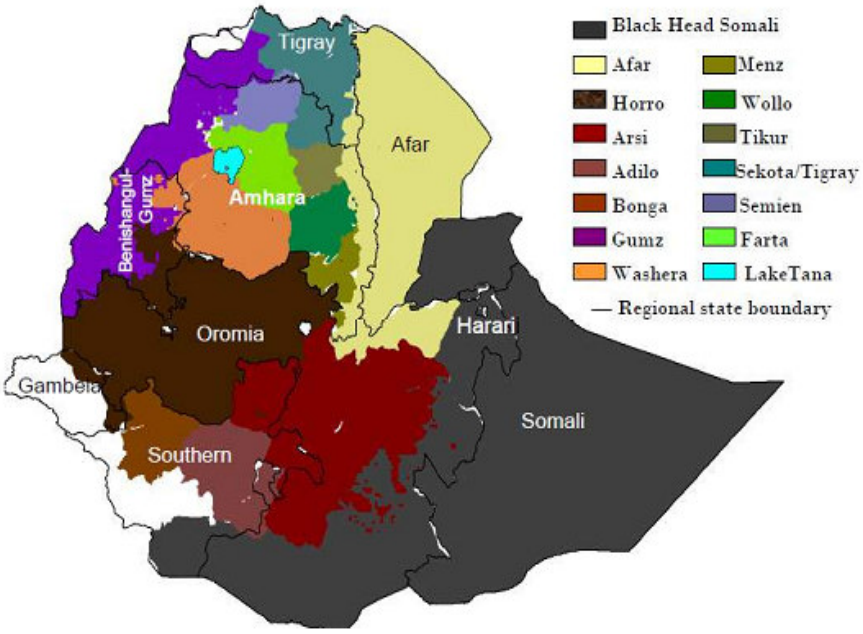

Figure 1: Geographic distribution of sheep in Ethiopia

Figure 1: Physical characteristics of sheep types in Ethiopia

3.1. Reproductive Performances of sheep

Good reproductive performance is a prerequisite for any successful genetic improvement and it determines production efficiency (Zewdu, 2008). Study suggests that differences exist in reproductive performance between indigenous sheep breeds and their variation allow for the selection of suitable breeds for a given environment (Mukasa-Mugerwa and Lahlou-Kassi, 1995).

Where breeding males are available in the flocks, age at first parturition is a good indicator of early sexual maturity in ewes. It is an economically important trait as greater population turnover and more rapid genetic progress can be obtained when sheep produce their first progenies at an earlier rather than later age. Early maturing females are also known to have a relatively long and fruitful reproductive life (Mukasa-Mugerwa and Lahlou-Kassi, 1995). Reproductive performance depends on various factors including age at first lambing, litter size, lambing interval and the life time productivity of the ewe, the last one being related to longevity (Sulieman et al., 1990; cited by Amelmal, 2011).

3.1.1. Age at first service

Results revealed that age at first mating for both sexes is not fixed and sheep are left to nature to reproduce. According to Zewdu (2008) age at first service for Bonga breeds were 7.51 ± 2.14 and 9.3 ± 2.2 months for males and females, respectively and for Horro breeds were 7.1 ± 3 and 7.8 ± 2.4 months for males and females, respectively. The age at first service of 10 months reported by Zewdu (2008) seem to be lower than that reported in traditional systems for Menz sheep (Mukasa-Mugerwa and Lahlou-Kassi 1995). According to the Amelmal (2011) Age at sexual maturity (puberty) was 11.05±1.6, 10.88±1.7 and 9.5±1.4 months for males and 11.13±2.7, 10.8±1.9 and 9.5±1.4 months for females in Tocha, Mareka and Konta, respectively.

The sexual maturity (puberty) in local sheep in Illu Abba Bora and Gumuz female sheep was reported to be 5-8 and 7.21 ± 1.75 months, respectively (Dhaba, 2013 and Solomon, 2007). The result of Tsedeke (2007) for age at puberty of local Alaba sheep were 6.7 and 6.9 months for male and female respectively. These were in close agreement with Zewdu (2008) and Dhaba (2013) but not with Amelmal (2011).

3.1.2. Age at first lambing

Total life time production (life time lamb crop) can be increased by encouraging first lambing at an early age (Amelmal, 2011). Age at first lambing is based on breed, husbandry and management practices and has wide variation among African sheep. In most traditional systems, first lambing occurs at 450-540 days when ewe weights are 80-85 percent of mature size (Wilson, 1986) and Poor nutrition, disease or parasitic burdens and genotype limit early growth and it can put obstacle for early maturity for giving first birth. Year and season of birth in which the ewe lamb was born influence age at first lambing through their effect on feed supply and quality during different season (Mukasa-Mugerwa and Lahlou-Kassi, 1995).The age at first lambing for some of indigenous sheep breeds / types has been summarized in table 2. The difference were attributed to the variation in availability and quality of feed resource across the difference seasons. Wilson and Murayi (1988) investigated that lambs born for twins had longer age at first lambing than their counterpart single born lambs.

Table 2. Age at first lambing of Ethiopian indigenous sheep breeds/types

Breed/Type	AFL(months)	Source
Gumuz	13.67	Solomon (2007)
Menz	16.5	Gautsch (1987)
Menz	15.22	Abebe (1999)
Menz	17.06	Niftalem, 1990
Thin-tailed sheep	13.7	Mukasa-Mugerwa et al. (1986)
Washera	15.46	Mengiste, 2008
Blackhead Ogaden	23.56 ± 3.63	Fikrte, 2008
Bonga	14.9 ± 3.1	Zewdu, 2008
Horro	13.3 ± 1.7	Zewdu, 2008
Arsi-bale	12.7	Tsedeke, 2007
Adilo	14.6	Getahun, 2008
Local sheep in Adaa Liban	17.07	Samuel , 2005
Local sheep in Alaba	12.7	Tsedeke, 2007
Local sheep in Tocha	12.88±1.7	Amelmal, 2011
Local sheep in Mareka	14.75±1.8	Amelmal, 2011
Local sheep in Konta	14.77±1.8	Amelmal, 2011
Local sheep in Illu Abba Bora	10 – 13	Dhaba , 2013
Local sheep in Gamogofa Zone	12.4±0.28	Fsahatsion, 2013
Local sheep in Ada Barga and Ejere	14.29±0.08	Yadeta, 2015

3.1.3. Lambing interval

The interval between two successive parturitions is called lambing interval and one of the main components of reproductive performance which is affected by the breed (Wilson and Murayi, 1988), season (Abebe, 1999), year of lambing (Niftalem, 1990), season (Mengiste, 2008) parity of ewes, post-partum body weight and management practice (Gautsch, 1987), type of management, nutrition, type of mating (Mukasa-Mugerwa and Lahlou-Kassi, 1995; Gbangboche et al., 2006). Management practices and restrictions on breeding also prolong the interval between lambing (Suleiman et al., 1990). In condition of good management adequate nutrition lambing interval of 8 months can be achieved in other words it can be possible to attain three lambing from indigenous sheep in two years (Sani and Tiwari, 1974). According to Solomon (2007) in association with the above thought Gumuz breed had an average lambing interval of 6.64 ±1.13 months so the breed can produce three lambing in two years even under the traditional management system but the work of (Belete, 2009) and Zewdu (2008) indicates that lambing interval of Bonga and Horro ewes were around 8 and 7.8 ± 2.4 month respectively. Among other breeds of sheep in Ethiopia that had short lambing interval were Menz (8 and half month) and Afar sheep (9 month) Tesfaye (2008). The lambing Interval for some of indigenous sheep breeds/types are summarized in Table.3. Genetic and environmental differences led to wide variation of lambing interval among different sheep breeds.

Table 3. Lambing Interval of Ethiopian indigenous sheep breeds/types

Breed/Type	LI(months)	Source
Gumuz	6.64 ±1.13	Solomon (2007)
Menz	8.5	Tesfaye (2008)
Menz	12.7-13.6	Niftalem, 1990
Menz	7.6-9.1	Abebe (1999)
Local sheep around Dire Dawa	11.2-11.3	Aden (2003)
Afar sheep	9	Tesfaye (2008)
Washera	9.16	Mengiste, 2008
Blackhead Ogaden	10.46	Fikrte, 2008
Bonga	8	Belete, 2009
Bonga	8.9 ± 2.1	Zewdu, 2008
Horro	7.8 ± 2.4	Zewdu, 2008
Arsi-bale	12.7	Tsedeke, 2007
Local sheep in Gamogofa Zone	7.34±0.13	Fsahatsion, 2013
Local sheep in Gomma district	7.87-8.04	Belete , 2009
Local sheep in Alaba	9.19±0.08	Deribe, 2009
Local sheep in Tocha	11.62±3.8	Amelmal, 2011
Local sheep in Mareka	10.33±4	Amelmal, 2011
Local sheep in Konta	11.02±3.8	Amelmal, 2011
Local sheep in Illu Abba Bora	9-12	Dhaba , 2013
Local sheep in Ada Barga and Ejere	8.83±0.44	Yadeta, 2015

3.1.4. Litter size

Litter size is largely determined by ovulation rate but is also modified by fertilization rate and embryonic and fetal losses (Gatenby, 1986) and ovulation rate can be dependent on breed, level of nutrition, season and age (Haresign, 1985). Significantly age of the dam can have effect on number of lambs per lambing. Until the age of five years or fourth parity liter size can be increased then it decreased slightly above this age (Wilson et al., 1984). On the other studies increased litter size with an increase in parity and higher litter size at fifth parity (Berhanu and Aynalem, 2009); peak prolificacy is generally achieved between 4 and 8 years of age (Notter, 2000).

Level of nutrition has effect on litter size in that, poor nutrition during service period lead to reduced ovulation rates and increase embryonic mortality and consequently decrease litter size (Gautsch, 1987). The percentage of ewes having twins in tropical sheep breeds, generally range between 0 and 50% (Gatenby, 1986) and while under traditional management conditions the percentage tends to fall below 10%. According to Zewdu (2008) a twining rate of 39.9 % or litter size of 1.40 and 36 % or litter size of 1.36 were obtained for Bonga and Horro sheep breeds, respectively , whereas low twining rate was reported for both Menz1.13 (Mukasa-Mugerwa et al. 2002) and Afar sheep 1.03 (Wilson, 1982).

Litter size is influenced by genotype, parity, season, and ewe body weight at mating (Mukasa-Mugarwa and Lahlou-Kassi, 1995) and management system is also a major source of variation in litter size as reported by Mekuriaw et al. (2013). Some representative litter size of indigenous sheep of Ethiopia is presented in Table 4.

Table 4. Litter size of Ethiopian indigenous sheep breeds/types

Breed/Type	Litter size	Source
Gumuz	1.17	Solomon (2007)
Menz	1.08	Gautsch (1987)
Menz	1.14	Agyemang et al. (1985)
Menz	1.13	Mukasa-Mugerwa et al. (2002)
Menz	1.02	Niftalem (1990)
Thin tailed	1.30	Mukasa-Mugerwa and Teklye (1988)
Afar sheep	1.03	Wilson (1982)
Washera	1.11	Mengiste, 2008
Blackhead Somali	1.04	Galal (1983)
Bonga	1.40	Zewdu, 2008
Horro	1.36	Zewdu, 2008
Horro	1.34	Abegaz et al. (2002) &Solomon and Gemeda (2000)
Adilo sheep	1.42	Getahun (2008)
Local sheep in Gamogofa zone	1.3±0.04	Fsahatsion, 2013
Local sheep in Alaba	1.51+0.04	Deribe, 2009
Local sheep in Ada Barga and Ejere	1.19±0.42	Yadeta, 2015
Twining rate (percent)		
Local sheep in Tocha	24.75±7.9	Amelmal, 2011
Local sheep in Mareka	37.8±12.9	Amelmal, 2011
Local sheep in Konta	39.06±17.9	Amelmal, 2011

3.1.5. Reproductive life span and life time lamb crop

Long reproductive life span in tropical (unfavorable) condition is one of the adaptation traits of tropical livestock. According to Zewdu (2008) the average reproductive life span of Horro and Bonga ewes were 7.9 ± 3.1 years and 7.4 ± 2.7 years, respectively. Long term reproductive performance (long living, high fertility, ability to produce more offspring) of dams should be given more importance in selection programs (Zewdu, 2008). According to Solomon (2007) in a circumstance that there is lack of comparative figures for Ethiopian breeds, quite long reproductive life span of Gumuz breed (8.5 years for ewes and 3.67 years for rams) was reported. The average reproductive life span of Tocha, Mareka and Konta local ewes were 9.17±1.70, 9.82±1.51and 9.28±1.62 years, respectively (Amelmal, 2011) which is longer than the above reported. These were in close agreement with Yadeta (2015) 10.52 ± 1.3 years for Local sheep in Ada Barga and Ejere districts. The life time lamb crop is very important trait to improve sheep productivity and profitability. According to Zewdu (2008) on an average a Bonga and Horro ewe delivers 12.2 ± 1.80 and 15.3 ± 4.3 lambs in her life time. Also, similar result was reported for Gumuz sheep (13.5 ± 1.76 lambs) in Metema areas (Solomon, 2007).

The results of the study for local ewe produce on average 8.57±3.7 (Tocha), 8.62±4.1 (Mareka) and 10.78±4.7 (Konta) lambs in her life time (Amelmal, 2011). This figure is much lower than the figure reported by above two author and Average reproductive life span and life time lamb crop of some indigenous sheep breeds/types are summarized in table 5.

Table 5. Average reproductive life span and life time lamb crop of some indigenous sheep breeds/types

Breed/type	RLS of female (year)	life time lamb crop	Source
Bonga	7.9 ± 3.1	12.2 ± 1.80	*Zewdu (2008)*
Horro	**7.4 ± 2.7**	15.3 ± 4.3	*Zewdu (2008)*
Gumuz	8.5	13.5 ± 1.76	*Solomon (2007)*
Tocha local sheep	9.17±1.70	8.57±3.7	*Amelmal (2011)*
Mareka local sheep	9.82±1.51	8.62±4.1	*Amelmal (2011)*
Konta local sheep	9.28±1.62	10.78±4.7	*Amelmal (2011)*
Shinile and Erer local sheep	9.12 ± 1.6	8.18 ± 2.27	*Fikrte (2008)*
Ada-Barga and Ejere	**10.52 ± 1.3**		*Yadeta (2015)*

3.2. Reproductive characteristics

3.2.1. Puberty in Female

It is difficult to have an accurate measure of puberty unless hormonal assays are done at certain intervals (biweekly) (Abebe, 2009) on an experimental stations, puberty may be recorded as the first behavioral estrus observed. The preferred definition of puberty in female sheep is the age the growing female displays first estrus (Mourad R, et al, 2015).

A study conducted by Mukasa-Mugarwa and Lahlou-Kassi (1995 cited by Mourad R, et al, 2015) investigated the reproductive performance of Menz sheep in the Ethiopian highlands. Researchers reported that lambs attain puberty at 10 months of age and 16.9 kg mean weight, corresponding to 56 percent of mature body weight. This is lower than the 11.5 months previously reported by Mukasa-Mugarwa et al. (1991). The researchers have found that 70 percent of Menz ewe lambs are capable of reaching puberty before 14 months (Demeke et al., 1995). Progesterone concentrations, determined by the ELISA technique, were basal (≤1.0 ng/ml) before puberty. Subsequently, 63 percent of lambs exhibited a "silent ovulation" prior to first behavioural estrus. Transient rises of progesterone were not observed in 45 percent of lambs conceiving at first mating. Further, 21.1 percent of the animals did not ovulate during the first estrus, which may bias estimates of puberty onset based only on first estrus behaviour (Mukasa-Mugarwa and Mutiga, 1993).

Mukasa-Mugarwa et al, (1991) reported that improved growth rate and body weight, resulting from better post-weaning nutrition, advanced the attainment of puberty in Menz ewe lambs; The onset of puberty is earlier with higher weaning weights; it is probable that poor nutrition can delay puberty by one season.

However, characteristics of puberty can differ for the various sheep breeds. Age at puberty is impacted by genotype, the season of birth (for seasonal breeds), and plan of nutrition. For example, Horro ewe lambs can have their first oestrus 28 days earlier than the Menz counterparts (Toe et al., 2000).

The same study demonstrated the following results due to improved nutrition Mukasa-Mugarwa and Lahlou-Kassi (1995 cited by Mourad R, et al, 2015):

- Post-weaning average daily weight gain up to puberty increased by six to 26 g/day.
- Conception rate at first estrus increased by nine to 16 percent.
- Mortality rate reduced by 24 to 31 percent.
- The age at first lambing reduced by two to five months.

As Abebe (2009) thought, it is difficult to have an accurate measure (reports) of puberty for other indigenous Ethiopian sheep breeds/types.

3.2.2. Puberty in Male

Mukasa-Mugarwa and Ezaz (1992) found that at puberty the mean age was 288±6 days, body weight was 19.3±0.4 kg, and condition score was 2.6±0.06 for Menz ram lambs. Another study (Toe et al., 2000) reported a mean age at puberty of 322.7 days for Horro and Menz ram lambs. Age at sexual maturity for Afar ram lambs is 7.10 months under pastoral management (Gizaw et al., 2013). These variation may be according to season of birth, level of nutrition, and weaning weight.

According to Mourad R, et al (2015) review, Semen and spermatozoa traits improve with age (Rege et al., 2000). For Horro and Menz breeds, researchers found no significant breed differences in any of the reproductive traits studied, with the exception of semen volume at nine months being 0.67 ml for Horro compared to 0.39 ml for Menz. A difference was also observed with the proportion of dead spermatozoa at 12 months (0.18 versus 0.23 for Horro and Menz respectively). Season has a significant impact on most of the traits studied, which was mainly attributed to nutrition (Rege et al., 2000).

Daily gains in live weight and scrotal circumference (SC) for the period from weaning to puberty varied with level of nutrition, but not with drenching (Mukasa-Mugarwa and Ezaz, 1992). At puberty, SC averaged 23-23.5cm and 23-24cm for Menz and Horro rams, (Abebe, 2009). It increased linearly and was strongly correlated with age, body weight, wither height, and heart girth. The authors concluded that post-weaning nutrition management strongly influenced lamb weight gain, which is related to testicular growth and puberty onset in

Menz ram lambs. The authors proposed a scrotal size measurement as a criterion for early selection of tropical ram lambs (Mukasa-Mugarwa and Ezaz, 1992).

3.2.3. Estrus activity and seasonality

Seasonality of reproduction is a characteristic of sheep breeds from temperate latitudes where variations in the photoperiod trigger changes in ovarian cyclic activity between seasons. In tropical and equatorial latitudes, seasonality of reproduction is less important. While sheep in these latitudes might not be susceptible to changes in the photoperiod, alterations can result from other environmental and social cues, such as feed availability, ambient temperature, and social interactions (such as the presence of rams or estrus ewes in the flock)(Mourad R, et al, 2015).

Agyemang et al., (1985) study showed that the distribution of lambing's of Menz ewes among months of the year suggests year-round lambing with a peak in October and November. Most conceptions took place in June and July, which is the beginning of the major rainy season in the area. Although Menz ewes are year-round breeders, they appear to experience a reduction in sexual activity from June to September, which corresponds to the wet season. Only 79 percent of ewes displayed cyclic estrus activity in August and the number of heats per ewe per month dropped to 1.3 during the wet season.

The result of Mukasa-Mugerwa and Lahlou-Kassi, (1995); Progesterone profiles of the Menz ewes in the Ethiopian highlands revealed the failure of certain ewes to show estrus in the wet period. This is due to increased frequency of ovulations that are not accompanied by estrus, known as silent heat.

A study showed that ewes came into estrus 21 times (range 18-23) a year with no significant impact from level of nutrition (Mukasa-Mugerwa et al, 1993; cited by (Mourad R, et al, 2015). In the same study, other findings were as follows:

- Mean cycle duration was 17.9 days
- 22 percent of cycles were short (< or = 13 days)
- 56 percent of cycles were normal (14-19 days)
- 11 percent of cycles were long (20-26 days)
- Eight percent of cycles were silent or missed (27-40 days)
- Three percent experienced anoestrus (> or = 40 days)

3.2.4. Sexual activity in Male

Gizaw and Thwaites (1997) found that mating had adverse effects on live weight, body condition, and SC of Horro rams. There is a tendency for mean daily live weight loss to rise with increasing number of services during the period of peak sexual activity and over the whole joining period. Changes in SC were not significantly correlated with sexual activity. Pre-joining live weight and SC had no significant impact on the proportion of ewes served, rate of return to first service, and fertility. High losses of live weight and SC were observed during the stage of peak sexual activity. Increasing the supplementary feed provided to working rams at this stage, especially if the ewe/ram ratio is to be increased, is suggested.

In Horro rams, there is no significant benefit to be gained by increasing mating weight and SC from 30kg and 27 cm to 40 kg and 31 cm respectively (Gizaw and Thwaites, 1997).

However, Rams of Ethiopian sheep breeds experience a depression in their fertility during the rainy season (Mukasa-Mugarwa and Lahlou-Kassi, 1995).

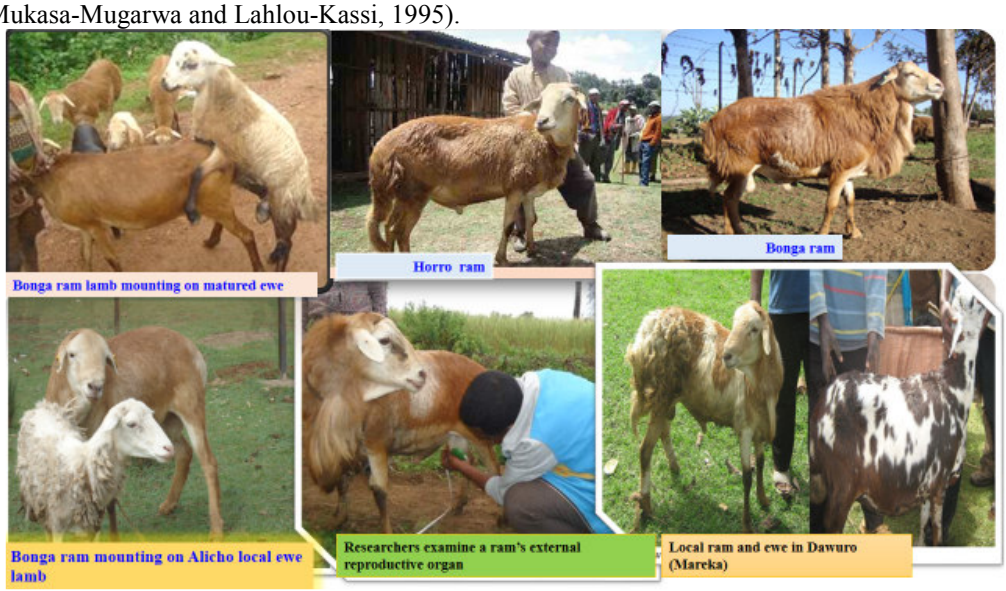

Figure 1: Sexual activity in Male

4. Conclusion and Recommendation

Ethiopia has a diverse indigenous sheep population numbering 27.3 million and owned by smallholder farmers as an integral part of the livestock sub-sector for trade and meat consumption in household. However, the annual meat production and off-take is very low as compared to the huge population and genetic source of country.

The reproductive performance of sheep in Ethiopia Showed variation among breeds / types, locations and differences or variation allow for the selection of suitable breeds for a given environment.

Reproductive performance of sheep depends on various factors including age at first lambing, litter size, lambing interval and the life time productivity of the ewe, the last one being related to longevity. Reproductive trait of Ethiopian indigenous sheep ranged from 6.7 - 10±.88 month (for male) and 6.9-11.13±2.7 month (for female), 11.5-23±3.63 month, 6.64±1.13-13.6 month, and 1.02- 1.51± 0.04 for AFS, AFL, LI and LS respectively.

Characteristics of puberty for indigenous Ethiopian sheep was differ for the various sheep breeds and Age at puberty is impacted by genotype, the season of birth (for seasonal breeds), and plan of nutrition. Menz ewe lambs are capable of reaching puberty before 14 months and Menz, Horro and Afar ram lambs reaching puberty at 288±6,322.7 and 213 days age.

Based on the present review it may be suggested as under:

- For further study the current reproductive performance of indigenous sheep in Ethiopia should be combined in one profile.
- On station evaluation of reproductive performance of indigenous sheep was not such that so, all nine genetically identified sheep breed should be tested on station level.
- No more information about Reproductive characteristics of indigenous sheep (except few breed), So, Young researchers should be characterize Reproductive performance non characterized indigenous sheep in Ethiopia.

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