

STUDY ON MORTALITY, CULLING AND REPLACEMENT INDEX OF NELLORE SHEEP IN AN ORGANIZED FARM

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ABSTRACT

The mortality, culling and replacement Index are important indicators to assess the efficiency of management followed in any organized farm. The present data was collected on Nellore Sheep at Livestock Research Station, Palamaner from the available records for 15 years (2000-01 to 2014-15) and analyzed. The results indicated that the overall mortality rate was high in adults 5.75% , followed by 6-12 months age (5.18%), 3-6 months age (4.43%) and 0-3 months age (4.31%). The overall culling rate was also high in adults 9.05% followed by 6-12 months age (4.25%), 3-6 months age (0.70%) and 0-3 months age (0.15%). The annual replacement index varied ranged from 0.54 to 2.44 with an overall average of 1.11 indicating that there is almost one female replaced in breeding stock for loss of one adult female.

Key words: Nellore jodipi, mortality, culling, replacement index.

INTRODUCTION

Sheep rearing is a profitable business for marginal and small farmers. Andhra Pradesh ranks first in the country with 26.39 millions of sheep population accounting for 40.57% of India's total sheep population (19th livestock census 2012). Nellore sheep is one of the popular mutton breeds with three strains namely Jodipi, Palla and Brown.

Mortality, culling and replacement of old stock are the major managerial activities of a successful sheep farm. Annual Replacement Index (ARI) is an important factor which represents the stable breedable female population in an organized farm. Replacement of female stock with young animals should be done to maintain required number of breedable female population so that the ARI will be maintained around 1.0 Every year there should be a regular monitoring on the mortality and culling and replacement. The present

study was conducted to know the mortality, culling and Annual Replacement index of Nellore sheep in an organized farm located in Andhra Pradesh.

MATERIALS AND METHODS

The study was conducted at the Livestock Research Station (LRS), Palamaner, Chittoor district, Andhra Pradesh a constituent unit of ICAR-Network Project on Sheep Improvement (NWPSI). This research station is maintaining Nellore Jodipi sheep under semi intensive rearing system with a routine herd health measures including regular vaccination and deworming. The lambs were weaned at the age of 3 months and the dams were added to the breeding stock after weaning. The data on mortality and culling were recorded regularly in farm registers. The major reasons for culling were off colour, surplus, stunted growth, old age, chronic health problems and reproductive problems. Every year old ewes were disposed off from the breeding stock and new female animals were added. The

ewes were bred after attaining 15 months age and 25 kg body weight. Selective breeding system is followed under controlled mating. Data on mortality, culling and Replacement Index were collected for a period of 15 years (2000-01 to 2014-15) from the available records. The mortality and culling rates were calculated age wise and overall for each year. The annual replacement index was calculated as per the following formula (Ram and Tomar, 1993).

$$\text{Annual Replacement Index} = \frac{\text{No. ewes lambing first time}}{\text{Total No. of ewes out going}}$$

The total number of ewes out going from the flock was calculated by taking account of all the deductions through mortality, culling, sale, external transfer, slaughter and predation/ missing. The age wise mortality and culling rates were subjected to analysis by Chi-Square test (Snedecor and Cochran, 1989)

RESULTS AND DISCUSSION

The overall mortality rate for all the age groups and all years was 5.00%. The overall mortality rate was high in adults 5.75%, followed by 6-12 months age (5.18%), 3-6 months age (4.43%) and 0-3 months age (4.31%) (Table 1) Similar results were observed by Soundararajan, (2014) in Madras Red sheep. The overall mortality, mortality at 0-3 months, 3-6 months and adults were highest during 2006-07, where as the overall mortality and mortality in adults were recorded least during 2000-01.

The overall culling rate for all the age groups and all years was 4.31%. The overall culling rate was also high in adults 9.05%, followed by 6-12 months age (4.25%), 3-6 months age (0.70%) and 0-3 months age (0.15%). Arun

kumar et al (2016) also reported high culling rates (7.91%) in adults and less in below 3 months age (0.67) in Sirohi goats. The Annual Replacement Index varied from 0.54 to 2.44. The overall culling rate was highest during 2002-03 and least during 2003-04 (Table 1).

The overall Annual Replacement Index (ARI) for all the age groups and all years was 1.11. The overall ARI was found to vary from 0.54 (2007-08) to 2.44 (2001-02). In a flock of Sirohi goats Arun Kumar et al (2016) observed an overall ARI of 0.74. Sneha pandey et al, (2012) observed 0.90 to 2.39 ARI in crossbred cattle. In some of the years, ARI values were less than 1 which was due to more number of breedable females disposed in that particular year and only few females replaced the deficit due to less female births. Higher frequency of abortion, still births, mortality and culling rate in female lambs born leads to fewer replacements, which would intern reduce the genetic gain as well as the economic return of that flock.

CONCLUSION

The Annual Replacement Index values obtained in the present study reveals that the there is almost one female replaced in breeding stock for loss of one adult female. The information generated from the study can be used to prepare effective strategies for breeding and management in Nellore jodipi sheep under farm and field conditions.

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Table 2: Annual Replacement in Index Nellore sheep

Year	No. ewes lambing first time	Deaths	Culling	Sale	Ext. transfer	Predation/ Missing	Total no. ewes outgoing	Annual replacement index
2000-01	51	7	18	-	-	-	25	2.04
2001-02	61	7	18	-	-	-	25	2.44
2002-03	80	15	75	-	-	-	90	0.89
2003-04	49	18	52	11	-	-	81	0.60
2004-05	66	13	66	-	-	-	79	0.83
2005-06	63	30	15	-	-	-	45	1.40
2006-07	105	32	26	-	-	-	58	1.81
2007-08	31	23	34	-	-	-	57	0.54
2008-09	72	23	47	-	-	-	70	1.04
2009-10	78	29	12	2	-	-	43	1.81
2010-11	87	22	44	-	-	-	66	1.31
2011-12	99	35	81	-	-	-	116	0.85
2012-13	98	21	84	-	-	-	105	0.93
2013-14	98	34	85	-	-	-	119	0.82
2014-15	137	21	58	-	-	-	79	1.73
Overall	1175	330	715	13	-	-	1058	1.11

Table 1: Mortality and Culling rates in Nellore sheep

Year	Mortality**					Culling**				
	0-3M	3-6M	6-12M	Adults	Overall	0-3M	3-6M	6-12M	Adults	Overall
2000-01	0.69 (286)	3.47 (144)	4.16 (120)	1.76 (511)	1.98 (1061)	-	-	3.33 (120)	11.74 (511)	6.03 (1061)
2001-02	1.43 (210)	4.15 (241)	2.43 (205)	5.50 (436)	3.85 (1092)	-	-	-	6.42 (436)	2.56 (1092)
2002-03	0.43 (231)	1.15 (172)	4.40 (159)	3.84 (390)	2.62 (953)	-	-	25.5 (159)	15.38 (390)	10.49 (953)
2003-04	1.87 (223)	5.61 (196)	11.64 (249)	4.45 (404)	5.50 (1072)	-	-	1.20 (249)	2.97 (404)	1.39 (1072)
2004-05	4.47 (323)	3.75 (133)	2.71 (184)	8.85 (350)	4.72 (1039)	-	3.0 (133)	0.54 (184)	13.43 (350)	5.00 (1039)
2005-06	2.40 (291)	3.04 (197)	5.66 (212)	9.71 (381)	5.74 (1081)	-	-	0.47 (212)	4.19 (381)	1.57 (1081)
2006-07	11.80 (331)	9.8 (140)	5.40 (148)	9.72 (360)	9.40 (979)	-	0.71 (140)	2.02 (148)	7.77 (360)	3.27 (979)
2007-08	7.38 (352)	8.54 (234)	6.84 (146)	6.86 (379)	7.38 (1111)	-	0.42 (734)	2.05 (146)	12.40 (379)	4.59 (1111)
2008-09	5.60 (250)	1.90 (368)	1.81 (165)	5.88 (391)	4.00 (1174)	-	-	2.42 (165)	8.95 (391)	3.32 (1174)
2009-10	6.99 (243)	3.89 (283)	2.21 (272)	7.03 (427)	5.22 (1225)	-	-	0.72 (272)	3.04 (427)	1.22 (1225)
2010-11	4.04 (396)	3.89 (257)	2.86 (210)	4.33 (577)	4.10 (1440)	-	-	1.90 (210)	8.49 (577)	3.68 (1440)
2011-12	6.63 (392)	8.95 (403)	4.57 (219)	6.18 (615)	6.76 (1628)	-	-	1.82 (219)	10.57 (615)	4.24 (1628)
2012-13	1.47 (339)	3.38 (295)	15.15 (231)	4.16 (624)	5.10 (1489)	-	-	1.29 (231)	4.48 (624)	2.08 (1489)
2013-14	2.78 (359)	4.62 (454)	4.63 (259)	6.45 (651)	4.93 (1723)	-	4.18 (454)	1.54 (259)	14.28 (651)	6.73 (1723)
2014-15	6.28 (366)	1.97 (456)	1.28 (234)	4.84 (620)	3.88 (1676)	1.91 (366)	0.66 (456)	22.22 (234)	10.16 (620)	7.46 (1676)
Overall	4.31 (4592)	4.43 (3973)	5.18 (3013)	5.75 (7114)	5.00 (18743)	0.15 (4592)	0.70 (3973)	4.25 (3013)	9.05 (7114)	4.31 (18743)

Figures in parentheses are no. of animals available in a particular age group; ** significant at 1% level