Original Research

A Comparative Analysis of Sheep Husbandry Practices Pertaining to Housing *vis-à-vis* Healthcare across Two Agro-Climatic Zones in Hassan District

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Abstract

Livestock production systems are influenced by the agro-climatic features of the area. The present study was carried out to record the sheep farming practices pertaining to housing and healthcare practices prevailing in two different agro-climatic zones of Hassan district. A multistage stratified random sampling technique was employed to collect information from100 sheep farmers from the study area. The farmers provided open (56 %) as well as closed (44 %) type of sheds for sheep and only 19 per cent of them were pucca houses. The sheds were mostly thatch (45 %) followed by asbestos (39 %), zinc sheet (09 %) and stone/tiles (7%). The floor was mud, dung, stone slabs, and concrete. Absolute majority of them practiced oral deworming and the schedule followed was thrice a year (40.90 %), four times a year (36.36 %), and twice a year (9 %). The sheep were mainly vaccinated against enterotoxaemia, hemorrhagic septicemia and Pestes-des-Petits. 62 per cent of them used disinfectants to clean the sheds. Though the sheep farmers are aware of the healthcare practices they lack knowledge of hygienic and scientific housing, necessitating creation of awareness among them to make sheep farming far more productive and profitable.

Key words: Agro-Climatic Zones, Hassan, Healthcare, Housing

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Introduction

Hassan district in Karnataka is one of the livestock rich regions of the state. Agriculture and animal husbandry are the major livelihood activities of the vast majority of people. As evident from the reports on

livestock statistics, this region possesses 3.63 per cent of the total livestock in the state. The region is also unique in its agro-geological features with four different agro-climatic zones with varying forms of livestock and agricultural activities. Sheep farming in particular is mostly traditional and extensive in nature and therefore, it is highly influenced by the agro-climatic components and various other natural parameters (Rajanna, *et al*., 2013).

Even though, the study area is a highly sheep intensive zone from the animal husbandry perspective, the data pertaining to housing and healthcare of sheep are not documented. As the above two criteria are chiefly responsible in determining the productivity and profitability in sheep farming, the present study was taken up to delineate the differences in housing and healthcare practices of sheep as adopted by the sheep farmers of the two agro-climatic regions.

Materials and Methods

Two agro-climatic zones by virtue of being geographically and topographically versatile - Central Dry Zone (Zone 4) and Southern Dry Zone (Zone 6), were selected for the present study. A multistage stratified random sampling technique was adopted to classify the study area and the stratification was made as district at the first stage, zone at the second strata and village as the final strata. Five villages from each zone (*i.e*., ten villages) and ten respondents from each village constituting 100 sheep farmers constituted the study group (50 from each zone). The farmers were selected at random for the collection of necessary information on the intended objective. Inputs on various aspects of sheep housing and healthcare practices adopted by each respondent were collected through a formal and personal interview using a pretested structured interview schedule. The data collected were tabulated and analyzed statistically for frequency and percentile, the differences between the zones were analyzed using chi square test using Microsoft Excel software package.

Results and Discussion

Housing Management

Housing is an essential and basic managemental prerequisite for efficient productivity and optimum health of animals. It was observed from the present study that 56 per cent of the sheep sheds across the two zones were open type and 44 per cent of them were closed type. In contrary to this finding, Rajanna *et al.* (2013) reported that 60.07 per cent of the sheds were semi open type. The open type of housing was predominant in Zone 4 (32 %) compared to Zone 6 (24 %) but the differences were not statistically significant. About 81 per cent of the houses were kutcha in nature, while 19 per cent were of pucca structured houses. The sheds were supported by wood, steel or stone structures and the roof was mostly thatch (45 %) and asbestos sheeted (39 %) followed by zinc sheet (9 %) and stone or tiles (7 %). The location of the shed was majorly

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within the close proximity of owner's dwelling places *i.e.* 50 per cent of the sheds were within the compound of the owner house, 28 per cent were just adjacent to their homes and 22 per cent were far away from their dwelling areas (at farms or their agricultural fields). The striking feature was 86.04 per cent of the sheds were built on no basement and only 13.95 per cent of the sheds had the basement and the material used for the walls was wood (62.5 %), brick (25 %) and stone (12.5 %). Vast majority of the sheds were mud floored (46 %), 32 per cent of them were dung floored, about 20 per cent of the sheds were built with stone floor and merely two per cent of the sheds had concrete floor (Table 1).

Table 1: Housing management of sheep in two agro-climatic zones of Hassan district

Criteria	Central Dry Zone	Southern Transition Zone	Overall
Location of the Shed			
Adjacent	15 (30)	13 (26)	28 (28)
Within Compound	16 (32)	34 (68)	50 (50)
At Far	19 (38)	03 (06)	22 (22)
	50	**50**	**100**
Type			
Open	32 (64)	24 (48)	56 (56)
Closed	18 (36)	26 (52)	44 (44)
	50	**50**	**100**
Structure			
Kutcha	45 (90)	36 (72)	81 (81)
Pucca	5 (10)	14 (28)	19 (19)
	50	**50**	**100**
Asbestos sheet	04 (08)	35 (70)	39 (39)
Stone/Tiles	01 (02)	06 (12)	07 (07)
Thatch	38 (76)	07 (14)	45 (45)
Zinc sheet	07 (14)	02 (04)	09 (09)
	50	**50**	**100**
Support			
Wood	39 (82.98)	06 (14.29)	45 (50.56)
Stone	04 (08.51)	05 (11.90)	09 (10.11)
Steel	04 (08.51)	31 (73.81)	35 (39.33)
	47	**42**	**89**
Basement			
Yes	06 (13.95)	06 (14.29)	12 (14.12)
No	37 (86.05)	36 (85.71)	73 (85.88)
	43	**42**	**85**
Wall			
Wood	20 (62.50)	08 (16.00)	28 (34.15)
Stone	04 (12.50)	05 (10.00)	09 (10.98)
Brick	08 (25.00)	37 (74.00)	45 (54.88)
	32	**50**	**82**
Floor			
Mud	23 (46)	12 (24)	35 (70)
Dung	16 (32)	07 (14)	23 (46)
Stone	10 (20)	31 (62)	41 (82)
Concrete	01 (02)	00 (00)	01 (02)
	50	**50**	**100**

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Manger			
Stone	04 (08)	15(30)	19 (19)
Cement	02 (04)	07 (14)	09 (09)
Wood	03 (06)	11 (22)	14 (14)
Other	05 (10)	00 (00)	05 (05)
None	36 (72)	17 (34)	53 (53)
	50	**50**	**100**
Waterer			
None	11 (22)	18 (36)	29 (29)
Constr	08 (16)	11 (22)	19 (19)
Cement	12 (24)	08 (36)	20 (20)
Other	19 (38)	13 (26)	32 (32)
	50	**50**	**100**
Drainage			
Mud	36 (78.26)	10 (23.81)	46 (52.27)
Stone	08 (17.39)	30 (71.43)	38 (43.18)
None	02 (04.35)	02 (04.76)	04 (04.55)
	46	**42**	**88**
White Washing			
Yes	22 (46.81)	37 (88.10)	59 (66.29)
No	25 (53.19)	05 (11.90)	30 (33.71)
	47	**42**	**89**
Frequency of White Washing			
None	08 (26.67)	05 (11.90)	13 (18.06)
6 Months	05 (16.67)	06 (14.29)	11 (15.28)
12 Months	06 (20.00)	07 (16.67)	13 (18.06)
Other	11 (36.67)	24 (57.14)	35 (48.61)
	30	**42**	**72**
Shed Cleaning			
Once	18 (37.50)	15 (35.71)	33 (36.67)
Twice	30 (62.50)	14 (33.33)	44 (48.89)
Weekly	00 (00.00)	13 (30.95)	13 (14.44)
	48	**42**	**90**

Figures in the parentheses are the percentages

Waterers and mangers are the prime requirement in the animal houses. About 29 and 53 per cent of the sheds had no facility of waterers and mangers, respectively complying with the fact that sheep housed in such sheds were fed and watered while they were grazed *i.e.*, exclusively extensive system of rearing. Mud drainage was provided in 46 per cent of the sheds while, 38 per cent had drainage built with stone and 4 per cent of the sheds had no drainage at all. Absolute majority of them practiced cleaning of sheds either on once daily basis (33 %), twice daily (44 %) and weekly basis (13 %).

The parameters with respect to the location of the shed, structure, roof type, basement, wall, floor, drainage and cleaning frequency of the shed varied significantly ($P<0.05$) between the zones. The reasons that could be attributed to these findings are; (a) the sheep farming in Zone 4 is most traditional and primitive in nature compared to Zone 6, (b) the climatological attributes vary greatly between the zones and (c) the income level and education status across the zones. The sheds in general were of low quality, lacking optimum

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ventilation and the type of floor predisposed the sheep for various diseases (Rao *et al*., 2008; Sharma, 2001). The kutcha type of floor was more predominant as it was cheaper and made using locally available gravel and sand. Though this type of floor was found to be unhygienic, owners presumed that this is helpful in quickly absorbing the moisture due to urine and defecation. These observations were in conformity with the findings of Rajanna *et al.* (2013) and Sharma *et al.* (2007). The use of thatch as roof material was highest because of its cost and local availability. Coconut tree leaves, maize and jowar stovers, bushes from forests were used as roofing materials. Though it was found to be advantageous, it was less durable and poor in hygiene (Rajanna *et al*., 2013). Kumaravelu (2008) had opined that practice of replacing the soil of the floor was beneficial but in the present study this practice was not observed in any zones.

Healthcare Management

Healthcare measures are the most neglected areas of routine management practices adopted by majority of the sheep rearers. Practices like deworming, vaccination, sanitation measures, control of external parasites etc. have a long term influence in optimizing the productivity.

Deworming

The present study revealed that absolute majority (100 per cent) of sheep owners followed deworming using oral drenching of anthelmintics to control the endo-parasites. The frequency of drenching and regularity of usage varied from zone to zone. Lambs were drenched regularly in about 80.4 per cent of the sheep flocks and 19.6 per cent of sheep owners were irregular with this practice. This phenomenon was similar in both the zones with non-significant difference between the zones. The frequency of deworming was mostly thrice a year (40.9 %) followed by four times a year (36.36 %), about 9 per cent of them followed twice a year regimen and 13.63 per cent owners practiced either twice or thrice a year (Table 2). The similar findings were reported by Mehta *et al.* (1995) and Devendran *et al.* (2010) whereas Sunkara *et al.* (2017) reported that Nellore sheep were dewormed four times a year. Concurrent results were also noticed for even the adult animals. The drenching frequency varied significantly between the zones ($P<0.05$) which could be due to the drastic variation in the socio-economic status and literacy levels of the sheep owners of the two regions. The dosage of the dewormer was mostly decided by the veterinarian (73.91 per cent), about 19.56 per cent of them depended on self-decision and whereas 6.52 per cent adhered to the advice of other sheep owners in choosing the right dosage. Swarnkar and Singh (2010) in Rajasthan reported that the sheep owners used anthelmintics indiscriminately and mostly relied on the pharmacy owners and stockists to choose the drug and its dosage.

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Table 2: Healthcare management of sheep in two agro-climatic zones of Hassan district

Criteria	Central Dry Zone	Southern Transition Zone	Overall
Deworming			
Lamb			
Regular	37 (80.43)	39 (82.98)	76 (81.72)
Irregular	09 (19.57)	08 (17.02)	17 (18.28)
	46	**47**	**93**
Frequency			
2 to 3	16 (36.36)	31 (79.49)	47 (56.63)
3 to 4	18 (40.91)	08 (20.51)	26 (31.33)
4 to 5	06 (13.64)	--	06 (07.23)
5 to 6	04 (09.10)	--	04 (04.82)
	44	**39**	**83**
Adult			
Regular	32 (72.73)	34 (72.34)	66 (72.53)
Irregular	12 (27.27)	13 (27.64)	25 (27.47)
	44	**47**	**91**
Frequency			
2 to 3	05 (14.71)	--	05 (07.35)
3 to 4	10 (29.41)	25 (73.53)	35 (51.47)
4 to 5	07 (20.59)	04 (11.76)	11 (16.18)
5 to 6	12 (35.29)	05 (14.70)	17 (25.00)
	34	**34**	**68**
Dosage			
Self	09 (19.57)	03 (06.00)	12 (12.50)
Vet	34 (73.91)	42 (84.00)	76 (79.17)
Advise of others	03 (6.52)	05 (10.00)	08 (08.33)
	46	**50**	**96**
Post Mortem			
Yes	17 (36.17)	22 (46.81)	39 (41.49)
No	30 (63.83)	25 (53.19)	55 (58.51)
	47	**47**	**94**
Healthcare Provider			
SM	14 (28.00)	04 (08.00)	18 (18.00)
TP	06 (12.00)	06 (12.00)	12 (12.00)
Vet	30 (60.00)	40 (80.00)	70 (70.00)
	50	**50**	**100**
Use of Disinfectant			
Yes	25 (50.00)	37 (74.00)	62 (62.00)
No	25 (50.00)	13 (26.00)	38 (38.00)
	50	**50**	**100**
Frequency			
Weekly	03 (06.00)	--	03 (03.00)
Monthly	15 (30.00)	24 (48.00)	39 (39.00)
Other	19 (38.00)	13 (26.00)	32 (32.00)
None	13 (26.00)	13 (26.00)	26 (26.00)
	50	**50**	**100**

Figures in the parentheses are the percentages

The effect of zone on the treatment options for sick animals was found to be significant (P<0.05). Around 60 per cent of them depended on the local veterinarians, while 28 per cent resorted to self-medication and

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12 per cent of them were more comfortable in approaching the traditional practitioner for treating the ailing animals. Concurrent results were also reported by Rao *et al*. (2008). With respect to the disposal of dead animals, 63.83 per cent of them either threw the carcass into open fields or unused barren lands without conducting any post mortem while, 36.17 per cent relied on conducting post mortem of the dead carcass. In contrary, Ananda Rao (2013) observed that the dead animals were either consumed or buried without any post mortem being done.

Vaccination

As it is evident from the previous reports and concurrence to the findings of Rajanna *et al.* (2013), the sheep owners have fair good access to the services of the government veterinary agencies and as per the policy mandates of these institutes, all the animals are covered under free vaccination programme against various diseases of economic importance. Mainly the animals were immunized against enterotoxaemia (ET), hemorrhagic septicemia (HS) and Pestes-des-Petits (PPR). Similar findings were also reported by Meena *et al.* (2018). There were also observations wherein animals were also vaccinated against sheep pox and Foot and Mouth Disease (FMD), but the findings were not found all over the region and the probable reason could have been the endemicity of these diseases in sheep.

About 97 per cent of the sheep farmers vaccinated their animals against ET, followed by 96 per cent for HS and 88 per cent for PPR (Table 3). There was a non-significant difference between the zones with respect to the practice of vaccination. The above results were in parallel with the findings from the study conducted by Rao *et al.* (2008).

Table 3: Vaccination of sheep in two agro-climatic zones of Hassan district

Disease	Frequency	Central Dry Zone	Southern Transition Zone	Overall
ET	Always	32 (64.0)	18 (38.3)	**97**
	Seldom	18 (36.0)	29 (61.7)	
	Total	**50 (100.0)**	**47 (94.0)**	
HS	Always	29 (63.0)	13 (26.0)	**96**
	Seldom	17 (37.0)	37 (74.0)	
	Total	**46 (92.0)**	**50 (100.0)**	
PPR	Always	28 (68.3)	35 (74.5)	**88**
	Seldom	17 (31.7)	12 (25.5)	
	Total	**41 (82.0)**	**47 (94.0)**	

Figures in the parentheses are the percentages

Use of Disinfectant

The use of disinfectant in the sheds as a measure of hygiene was also studied and it was a positive finding that 62 per cent of the sheep owners were using disinfectants to clean their sheds but with varied frequency. About 39 per cent practiced monthly usage, 32 per cent used disinfectants irregularly (during certain

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occasions like festivities, domestic functions etc.), 26 per cent of the sheep owners used it very rarely and only 3 per cent of them used on weekly basis. Sizeable proportion (38 %) of them never had the practice of using any disinfectant to clean their sheds (Table 2). The zone wise differences with respect to disinfectant usage was statistically non-significant.

Conclusion

The present study revealed that the sheep farmers of the two agro-climatic zones have poor level of knowledge regarding scientific housing and fairly good enough in adopting health care practices for their sheep. More specifically, they give due importance to immunization, deworming, use of disinfectants etc. but the housing component lacks the same intensity of importance i.e. the housing of sheep was based more on traditional knowledge and experience rather in lines with modern scientific housing with minimal requirements. Creation of awareness in sheep farmers to pursue scientific housing and healthcare practices are essential in improving the productivity and profitability of sheep, thereby enhancing the socio-economic status of the sheep farmers in this region.

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