



Health Care Management Practices Adopted for Organic Poultry Farming in TSP and Non-TSP Area of Rajasthan

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ABSTRACT

Background: There are a number of densely situated marginal, small as well as large farmers, registered as well as unregistered poultry farms in the various pockets of this region. This region has witnessed a revolutionary history of poultry growth for decades. It seems that there is great potential in rearing of poultry under backyard farming system which is one of the pre-requisite components for organic poultry farming. Keeping these facts and looking the importance and due to limited information regarding organic poultry farming and documentation and validation of ethnoveterinary remedies should be carried out for treatment of poultry disease under organic poultry system.

Methods: An analytical study of organic poultry farming was conducted on 240 randomly selected poultry farmers of 16 villages in 08 tehsils of 04 districts of Non-tribal and Tribal areas of southern Rajasthan to identify the different types of health care practices adopted by the respondents in rearing of poultry farming.

Result: The data on health management practices revealed that majority of the respondents practice self-treatment of sick birds (43.33 and 41.67%), do not follow vaccination of chicks (85.00 and 92.50%), attack by a predator was the main cause of mortality (60.00 and 61.67%), coryza was the major disease encountered at their farm (55.00 and 60.00%), do not follow deworming programme (79.16 and 90.83%), reported non-availability of veterinary facilities (94.16 and 96.67%) and do not use antibiotics/growth promoters for poultry with (100 and 100%), respectively in Non-TSP and TSP area. The majority of respondents throw the dead birds in the open (85.40 and 91.67%), don't use lime/quick lime for disinfection in poultry shed (85.84 and 95.84%), culling the birds due to sickness (50.83 and 53.33%), use herbal medicine (85.00 and 79.16%), cleaning of water trough weekly (60.00 and 64.16%), reported 15-20 percent mortality (55.00 and 50.00%) and report monsoon season is major seasonal incidence of disease with 62.50 and 67.50%, respectively in Non-TSP and TSP area.

Key words: Disease, Health, Organic poultry, Vaccination.

INTRODUCTION

Poultry farming has certain distinctive features that make it an ideal subsidiary occupation, especially for weaker sections of the rural community (Toor and Goel, 2024). India's poultry industry has become the most dynamic rapidly growing sector of the livestock economy, as proven by the fact that production reached approximately 138.38 billion eggs in 2022-2023 with growth rate 33.31% increase over the previous five years, compared to estimates of 103.80 billion eggs in 2018-19 (Kumaravel *et al.*, 2024). In the globe, India is the third largest producer of eggs and eighth largest producer of chicken meat (Pandey *et al.*, 2022). According to the last two years statistical data, India has 851.81 million poultry population (BAHS, 2020-21). The total meat production from poultry is 4.99 million tons in 2022-23, contributing about 51.14% of total meat production according to BAHS, 2022-23. However, Rajasthan ranks 18th in poultry population 80.24 lakh (Livestock Census, 2012) which is less than 2 % of India's poultry population (Mishra *et al.*, 2019). The per capita availability of eggs per year in Rajasthan is very low (34 eggs) as compared to the national average of 101 and much lower than eggs recommended by the Nutritional Advisory Committee of ICMR (180 eggs per capita per year) which suggests great scope of improvement in poultry production in Rajasthan.

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Organic livestock farming is most suitable to our Indian conditions because Indian farmers follow indigenous technical knowledge and practices but organic poultry production is still lagging (Chander and Mukherjee, 2005). In comparison to, India exports organic products to every continent in the world, with the EU receiving the largest share (44.12%) followed by Canada (21.57%), the United States (19.18%) and Asian nations (12.70%) (APEDA, 2014; Deshmukh and Babar, 2015). Consumers are now becoming

more self-aware of the safety and high quality of the food items they consume daily (Ambali and Bakar, 2014).

Presently, in India among the all-states, Madhya Pradesh has the highest contribution with 27% of the total land area under organic farming followed by Rajasthan (0.35 million ha.) and Maharashtra (0.28 million ha.). Whereas in hill states Sikkim has the highest area of organic agricultural land and Arunachal Pradesh has the least organic agricultural land (Naik *et al.*, 2022). The plant wealth of India also offers the people who tend livestock a rich reservoir for treating the diseases and ailments of the animals (Verma, 2014). In India, livestock farmers still follow the community-based local or indigenous knowledge and methods for therapeutic and managing livestock production (Misra and Kumar, 2004). Poultry population in MPUAT service area Udaipur district sustain first rank with 5.43 lacs in southern region of Rajasthan (Livestock Census, 2012).

MATERIALS AND METHODS

The present study was conducted during August 2021 to September 2022. The study evaluated the practices of poultry farmers in Southern Rajasthan, focusing on organic poultry farming in seven districts. Two tribal districts, Udaipur and Dungarpur and two non-tribal districts, Bhilwara and Chittorgarh, were chosen based on their poultry population and farming scope. A comprehensive list of organic poultry reared was collected from each identified village, with assistance from Department of Animal Husbandry, patwari and agriculture supervisors. From the list so prepared, two villages were selected from each selected tehsil based on the maximum number of poultry farmers. Thus, a total of sixteen villages were taken for the study purpose and identified for the present investigation. For the selection of respondents, a comprehensive list of farmers who had at least 15-20 poultry bird rearing was prepared from selected villages with the help of respective patwari, gram sevak and key informants. From the sites formative list, 15 farmers were selected randomly from each identified village. Thus, the total samples were 240 poultry rearers were included in the present study. Based on experience gained through pre-testing suitable modifications were made in the construction and sequence of questions. The area of study lies under the jurisdiction of Department of Animal production, Mahatma Pratap University of Agriculture and Technology, Udaipur. To arrive at a logical interpretation, the data were compiled, tabulated and analyzed as per Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

Treatment of sick birds

The study found that most respondents in Non-TSP and TSP areas treat their sick birds themselves, with 43.33 and 41.67% respectively. Local expert treatment was the second

most preferred method, followed by "No treatment" treatment for 10.00 and 16.67%, respectively. Only 4.17 and 3.33 per cent treated their sick birds by a veterinary doctor, possibly due to a lack of veterinary services and extension work in the study area. The majority of respondents used "Self" treatment for their sick birds. The study's findings align with Choudhary's (2017) findings, which found that 40.00% of respondents treated their birds themselves, followed by paravets (27.0%), local experts (15.00%) and veterinary doctors (3.00%), while 7% of respondents in unorganized systems did not treat their birds. Similar findings were also reported by Oladduni and Fatuase (2014); Rahman (2017); (Varadharajan and Gnanasekar, 2019) and Goswami *et al.* (2022).

Vaccination of chicks

The survey reveals that only a small percentage of poultry owners in Non-TSP and TSP areas follow vaccination practices for chicks, while the majority (85.00%) and 92.50% of poultry farmers do not, primarily due to poor knowledge about vaccination schedules and the lack of veterinary facilities in their areas. The results are similar to the findings of Nath *et al.* (2012) who reported that a small number (7.20%) of poultry farmers practiced vaccination of birds. Similar findings were also reported by Francis *et al.* (2016) and Sharma *et al.* (2018). On the contrary, Sihag (2020) reported that most poultry farmers were following vaccination practices in chicks, which is not in line with the present findings.

Main cause of mortality

The study found that predator attacks were the primary cause of mortality in poultry birds in both Non-TSP and TSP areas, with 60.00 and 61.67% of respondents, respectively. Outbreak of disease was the second leading cause, followed by cold weather with 7.50 and 10.00 percent of respondents from both areas. The findings are to the observations of Goswami *et al.* (2022) who reported that the major cause of mortality in the backyard system is the attack of predators (97.00%). Similar findings were also reported by Islam *et al.* (2015), Choudhary *et al.* (2018) and Bharti and Sagar (2020).

Common diseases encountered at farm

The study found that "Coryza," an acute respiratory disease of chickens, was the most common disease in poultry farms in both Non-TSP and TSP areas. Coccidiosis was the second most common disease, followed by diarrhea at 15.84 and 10.00 percent, respectively. The fourth most common disease was "Fowl pox," a viral disease, with 6.66 and 3.33 percent reported in both areas. These findings highlight the importance of addressing respiratory and viral diseases in poultry farming. The findings supported the views expressed by Goswami *et al.* (2022) who reported respiratory problems (23.00%), fowl pox (12.00%), coccidiosis (20.00%) and IBD diseases (17.00%) in backyard systems. Similar findings

were also reported by Francis *et al.* (2016) and Choudhary *et al.* (2018).

Deworming programme

The majority of poultry owners in both surveys did not follow the deworming program for their birds, with 79.16 and 90.83 per cent not following it. Only 15.00 and 6.67 percent used Ayurvedic medicine/herbal for deworming in Non-TSP and TSP areas and 5.84 and 2.50% used Allopathic medicine, while no Homeopathic medicine was used. The study confirms previous reports by Khandait *et al.* (2011), Rahman (2017) and Pralhad *et al.* (2020) that most poultry owners do not practice deworming against internal parasites in poultry birds. However, Mathialagan and Senthikumar (2012) found that the majority of respondents (80.00%) are aware of drug selection for deworming practices, contradicting the findings of the present study.

Availability of veterinary facilities/poultry assistant

The study found that 94.16 and 96.67% of poultry farmers in both surveyed areas reported that veterinary facilities were not available for treatments and vaccinations. The study's findings align with previous research, including Sharma *et al.* (2018); Nath *et al.* (2012) and Khandait *et al.* (2011), which found that a majority of respondents (85.83%) self-treated sick birds due to the absence of veterinary facilities. Budharam *et al.* (2021c) reported that only 14.57 per cent of recipients had access to veterinary facilities, contradicting the findings of the present study.

Use antibiotics/growth promoters

Respondents from Non-TSP and TSP areas reported not using antibiotics or growth promoters for artificially or synthetically increasing poultry birds. Samantaray *et al.* (2020) found that 25.0% of respondents were aware of antibiotic use in poultry birds before farmer training. Ezeibe *et al.* (2014) reported that most poultry farmers use antibiotics or drugs at an early age, contradicting the findings of Samantaray *et al.* (2020).

Disposal of dead birds

The majority of poultry farmers in Non-TSP and TSP areas dispose of dead birds through "Throwing in the open," with 85.84 and 91.67%, respectively. However, 14.16 and 8.33 percent of respondents in Non-TSP and TSP areas practice "Burial" and no respondents reported "burning" as a disposal method. Nath *et al.* (2012) found that the majority of respondents in a study area disposed of dead birds by throwing them in the open (69.00%), followed by 19.00% eaten and 12.00% buried methods. This contradicts Siddiky *et al.* (2022) findings, which revealed that the majority (58.10%) of poultry farmers disposed of dead birds by buried methods. Onyia *et al.* (2022) also reported that the majority (82.63 per cent) of the respondents sold their poultry wastes sell in the market contradicting the findings of the present study.

Use of lime/quick lime for disinfection of poultry shed

Table 1 reveals that 85% of poultry keepers in Non-TSP and TSP areas do not use lime/quick lime for poultry shed disinfection, while only 14.16 and 4.16 percent of respondents do so in these areas. The study aligns with previous research by Dutta *et al.* (2013) and Vineetha *et al.* (2021) that poultry owners in the study areas use traditional methods like ash and lime for controlling ectoparasites and floor disinfections. However, Ezeibe *et al.* (2014) found that 45.0% of respondents use disinfectants in poultry sheds before entrepreneurship training, contradicting the current findings.

Reasons for culling

The study found that the majority of respondents in Non-TSP and TSP areas cull their poultry birds due to illness, with 50.83 and 53.33 per cent, respectively. Old age was reported by 32.50 and 35.83 per cent, while poor productivity was cited by 16.67 and 10.84 per cent in both areas. These findings highlight the need for improved health and productivity in poultry farming. The findings support the views expressed by Weyuma *et al.* (2015) who reported that the majority of respondents (66.30%) cull their birds in the study area due to various reasons like sickness, poor productivity and old age of poultry birds. Similar findings were also reported by Desalew *et al.* (2013). However, Fekede and Tadesse (2021) reported that in the Western Oromia region, Ethiopia poor egg production was a major reason for the culling of poultry birds, which is not in line with the present findings.

Type of medicine used to control disease

The majority of respondents in Non-TSP and TSP areas used herbal/ethnoveterinary medicine for treating sick poultry birds (85.00%) and 79.16%, respectively. However, 10% and 16.67% did not use any medicine. Few respondents reported using allopathic medicine (5.00%) or herbal/ethnoveterinary medicine (4.17%) for treating poultry birds. No respondent was using "Homeopathic" medicine for the treatment of poultry birds in the survey area. The majority of respondents were using traditional knowledge for the treatment of their sick birds by preparing a medicine using different types of medicinal plants and herbs available in local conditions. The results of the present study conform with those of Muhiye (2007) who reported that the majority of poultry owners (87.60%) use traditional remedies to treat their diseased birds, which are generally administered through drinking water, whereas few respondents (12.40%) use modern medicines. Gogoi, (2022) reported that mostly respondents prefer home remedies to cure poultry disease rather than going to the veterinary hospitals because of the distance related issues. Goswami *et al.* (2022) reported that the majority of farmers (55.00%) use allopathic medicine to treat birds in the Varanasi district of Uttar Pradesh, which is not in line with the present study.

Table 1: Different management practices followed by organic poultry rearers. n=240

Health management practice	Non-TSP (n ₁ =120)	TSP (n ₂ =120)
Treatment of sick birds		
Self	52 (43.33)	50 (41.67)
Local expert	51 (42.50)	46 (38.33)
Veterinary doctor	5 (4.17)	4 (3.33)
No treatment	12 (10.00)	20 (16.67)
Vaccination of chicks		
Yes	18 (15.00)	9 (7.50)
No	102 (85.00)	111 (92.50)
Main cause of mortality		
Outbreak of diseases	39 (32.50)	34 (28.33)
Cold weather	9 (7.50)	12 (10.00)
Attack by predators	72 (60.00)	74 (61.67)
Common disease encountered at farm		
Coryza	66 (55.00)	72 (60.00)
Coccidiosis	27 (22.50)	32 (26.67)
Fowl pox	8 (6.66)	4 (3.33)
Diarrhea	19 (15.84)	12 (10.00)
Deworming program practiced		
By allopathic medicine	7 (5.84)	3 (2.50)
Homeopathic	00 (0.00)	00 (0.00)
Ayurvedic medicine/Herbal	18 (15.00)	8 (6.67)
Don't follow	95 (79.16)	109 (90.83)
Availability of veterinary facilities in your area		
Yes	7 (5.84)	4 (3.33)
No	113 (94.16)	116 (96.67)
Use antibiotics/growth promoters for poultry		
Yes	0 (0.00)	0 (0.00)
No	120 (100.0)	120 (100.0)
Disposal of dead birds		
Burial	17 (14.16)	10 (8.33)
Burning	0 (0.00)	0 (0.00)
Throwing in the open	103 (85.84)	110 (91.67)
Use of lime/quick lime for disinfection of poultry shed		
Yes	17 (14.16)	5 (4.16)
No	103 (85.84)	115 (95.84)
Reasons for culling		
Poor productivity	20 (16.67)	13 (10.84)
Old age	39 (32.50)	43 (35.83)
Sickness	61 (50.83)	64 (53.33)
Type of medicines use to control disease		
Allopathic	6 (5.00)	5 (4.17)
Homeopathic	0 (0.00)	0 (0.00)
Herbal /Ethnoveterinary medicine	102 (85.00)	95 (79.16)
None	12 (10.00)	20 (16.67)
Percentage of mortality		
<10%	12 (10.00)	9 (7.50)
10-15%	33 (27.50)	38 (31.67)
15-20%	66 (55.00)	60 (50.00)
>20%	9 (7.50)	13 (10.83)

Table 1: Continue...

Table 1: Continue...**Seasonal regularly incidence of disease (Adult bird)**

Winter season	18 (15.00)	15 (12.50)
Summer season	27 (22.50)	24 (20.00)
Monsson season	75 (62.50)	81 (67.50)

(Fig in Parenthesis indicate percentage).

Percentage of mortality

The study reveals that most farmers reported 15-20% mortality of poultry birds in their farms in Non-TSP and TSP areas, with 55.00 and 50.00% respectively. In Non-TSP and TSP areas, 27.50 and 31.67% reported 10-15% mortality, while 10% reported less than 10%. In TSP areas, 10.83% reported >20% mortality, while 7.50% reported >20% and <10% mortality, respectively. The results of the present study conform with those of Adedeji *et al.* (2014) who revealed that the majority of respondents (52.63%) reported mortality of "6-10%" in a year at a poultry farm. Mishra *et al.* (2009) also revealed that the majority of poultry farmers reported higher overall mortality in chicks (27.56%) as compared to adults (14.62%) in the study area.

Seasonal regularly incidence of disease

The study found that the majority of respondents in Non-TSP and TSP areas reported the "Monsoon season" as the major seasonal incidence of disease in poultry birds, followed by the "Summer season" with 22.50 and 20.00 percent and the least infestation in the "Winter season" with 15.00 and 12.50 per cent. The findings support the views expressed by Leta and Endalew (2010) who described revealed that the majority of poultry owners (80.00%) reported June-August month as the major seasonal incidence of disease followed by March-May (14.40%) and December- February (5.00%). Sankhyan *et al.* (2013) also observed that the majority of respondents (51.90%) in Himachal Pradesh reported the monsoon season as a major seasonal incidence of disease in adult birds followed by the winter season (30.90%) and summer season (17.20%) in the study area. Similar findings were also reported by Halima (2007) and Adedeji *et al.* (2014).

CONCLUSION

The present study found that most of the poultry farmers adopt health care practices, but often self-treat sick birds, don't follow vaccinations and face predator attacks. Coryza is the main disease encountered and they don't use antibiotics or growth promoters. They throw dead birds open, don't isolate sick birds and use herbal medicine. Monsoon season is the major seasonal disease incidence in study area.

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Conflict of interest

The authors declare no conflict of interest related to this study.

REFERENCES

- Atsbeha, A.T. (2013). Rural poultry production and health management practices in central zone of Tigray, Ethiopia. *Scientific Journal of Animal Science*. 2(12): 340-354.
- Adedeji, O.S., Amao, S.R., Alabi, T.J. and Opebiyi, O.B. (2014). Assessment of poultry production system in Ilesha West local government area of Osun State, Nigeria. *Scholars Journal of Agriculture and Veterinary Science*. 1(1): 20-27.
- Ambali, A.R. and Bakar, A.N. (2014). People's awareness on halal foods and products: Potential issues for policymakers. *Procedia-Social and Behavioral Sciences*, 121: 3-25.
- APEDA (2014). Organic production and current scenario in India. <http://www.apeda.gov.in/apedawebsite/organic/Organic-Products.htm> Basic Animal Husbandry Statistics Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers Welfare, Govt. of India. Annual Report (2020-21).
- Bharti, R. and Sagar, M. (2020). Production performance of backyard poultry reared by rural women in Budelkhand region of Uttar Pradesh. *The Pharma Innovation Journal*. 9(3): 34-37.
- Budharam, Gupta, L. and Kumar, L. (2021c). Health care management practices of backyard poultry rearing in Dungarpur district of Rajasthan. *Journal of Animal Research*, 11(4): 707-710.
- Chander, M. and Mukherjee, R. (2005). Organic animal husbandry: concept, status and possibilities in India-a review. *The Indian Journal of Animal Sciences*. 75(12): 1460-1469.
- Choudhary, M.S. (2017). Study of organized and unorganized sector of poultry production in Rajouri District of Jammu & Kashmir State. M.V Sc. Thesis, Division of Veterinary and Animal Husbandry Extension Education, Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu Main Campus, Chatha, Jammu-180009.
- Choudhary, M.S., Kumar, P., Bhushan, B. and Bafanda, R.A. (2018). Relationship between the differential managerial practices of poultry owners and their socio-personal, socio-economic and communicational characteristics in Rajouri District of Jammu and Kashmir State. *International Journal of Current Microbiology and Applied Sciences*. 7(8): 4533-4543.
- Desalew, T., Singh, H., Ashenefi, M., Wondimeneh, E. and Tadelle, D. (2013). Study on management practices and marketing systems of village chicken in East Shewa. Ethiopia. *African Journal on Agric Research*. 8(22): 2696-2702.

- Dutta, R.K., Islam, M.S. and Kabir, M.A. (2013). Production performance of indigenous chicken (*Gallus domesticus* L.) in some selected areas of Rajshahi, Bangladesh. *American Journal of Experimental Agriculture*. 3(2): 308-323.
- Deshmukh, M.S. and Babar, N. (2015). Present status and prospects of organic farming in India. *European Academic Research*. 3(4): 4271-4287.
- Dinka, H., Chala, R., Dawo, F., Bekana, E. and Leta, S. (2010a). Major constraints and health management of village poultry production in Rift valley of Oromia, Ethiopia. *American-Eurasian Journal of Agricultural and Environmental Sciences*. 9(5): 529-533.
- Ezeibe, A.B.C., Okorji, E.C., Chah, J.M. and Abudei, R.N. (2014). Impact of entrepreneurship training on rural poultry farmers adoption of improved management practices in Enugu State, Nigeria. *African Journal of Agricultural Research*. 9(20): 1604-1609.
- Erdaw, M.M. and Beyene, W.T. (2022). Trends, prospects and the socio-economic contribution of poultry production in Sub-saharan Africa: A review. *World's Poultry Science Journal*. 78(3): 835-852.
- Fekede, G. and Tadesse, Y. (2021). Breeding practices and preferred traits of indigenous chicken in Western Oromia region, Ethiopia. *Journal of Livestock Science*, 12:85-94.
- Francis, M.I., Liba, J.W., Atsanda, N.N. and Jukunda, R. (2016). Level of awareness of poultry disease and management practices by poultry farmers in Maiduguri, Borno State, Nigeria. *Nigerian Veterinary Journal*. 37(4): 230-235.
- Gabanakgosi, K., Moreki, J.C., Nsoso, S.J. and Tsopito, C. (2012). Ethnoveterinary medicine usage in family chickens in the selected four villages of Botswana. *Journal of Veterinary Advances*. 2(12): 586-594.
- Gogoi, C. (2022). Ethno-veterinary Treatment of Livestock and Poultry by Ethnic Community of Dhemaji District, Assam, India. *Agricultural Science Digest*. 42(3): 371-376. doi: 10.18805/ag. D-5386.
- Goswami, D.S., Paswan, V.K., Bagri, D.K. and Meena, J.P. (2022). Poultry production practices adopted by farmers in Varanasi district of Uttar Pradesh. *The Pharma Innovation Journal*, SP-11(2): 34-39.
- Halima, H.F.W.C., Naser, F.W.C., Marle-Koster, V. and De Kock, A. (2007). Village-based indigenous chicken production system in north-west Ethiopia. *Tropical Animal Health and Production*. 39(3): 189-197.
- Islam, M.S., Begum, I.A., Kausar, A.K.M.G., Hossain, M.R. and Kamruzzaman, M. (2015). Livelihood improvement of small farmers through family poultry in Bangladesh. *International Journal of Business Management and Social Research*. 01(02): 1-70. <http://dx.doi.org/10.18801/ijbmsr.010215.07>.
- Ithika, C.S., Singh, S.P. and Gautam, G. (2013). Adoption of scientific poultry farming practices by the broiler farmers in Haryana (India). *Iranian Journal of Applied Animal Science*. 3(2): 417-422.
- Kanakachari, M., Rahman, H., Chatterjee, R.N. and Bhattacharya, T.K. (2022). Signature of Indian native chicken breeds: A perspective. *World's Poultry Science Journal*. 78(2): 421-445.
- Khandait, V., Gawande, S., Lohakare, A. and Dhenge, S. (2011). Adoption level and constraints in backyard chicken rearing practices at Bhandara district of Maharashtra (India). *Research Journal of Agricultural Science*. 2(1): 110-113.
- Kisku, J., Oraon, J., Pandey, A.K., Singh, B.K. and Chandraker, K. (2019). Study of adoption level and constraints faced by rural women in backyard poultry farming. *Journal of AgriSearch*, 6(SI): 101-103.
- Kumaravel, V., Reddy, M.G. and Vasanthakumar, P. (2024). Influence of Seasons on Production Performance of Commercial Layer Chicken in Southern Region of Telangana. *Agricultural Science Digest*. doi: 10.18805/ag. D-5973.
- Leta, S. and Endalew, B. (2010). Survey on village-based chicken production and utilization system in mid Rift Valley of Oromia, Ethiopia. *Global Veterinaria*. 5(4):198-203. *Livestock Census (2012)*. Department of Animal Husbandry, Government of Rajasthan http://animalhusbandry.rajasthan.gov.in/livestock_census.aspx. Site assessed on 3/11/2020.
- Mandal, M. K., Khandekar, N. and Khandekar, P. (2006). Backyard poultry farming in Bareilly district of Uttar Pradesh, India: An analysis. *Livestock Research for Rural Development*. 18(7): 1-21. Article101. Retrieved June 19, (2022) , from <http://www.lrrd.org/lrrd18/7/mand18101.htm>
- Mandavkar, P.M., Hanmante, A.A., Talathi, M.S. and Manjarekar, R.G. (2020). Knowledge and adoption level of poultry farming practices in Raigad district of Maharashtra State. *Journal of Krishi Vigyan*. 8(2): 199-204.
- Mwale, M., Bhebhe, E., Chimonyo, M. and Halimani, E.T. (2005). Use of herbal plants in poultry health management in the Mushagashe small scale commercial farming area in Zimbabwe. *International Journal of Applied Research in Veterinary Medicine*. 3(2): 63-70.
- Mathialagan, P. and Senthilkumar, K. (2012). Extent of awareness and adoption of disease prevention and control by poultry farmer. *International Journal of Food, Agriculture and Veterinary Sciences*. 2(2): 1-4.
- Misra, K.K. and Kumar, K.A. (2004). Ethno-veterinary practices among the Konda Reddi of East Godavari district of Andhra Pradesh. *Studies of Tribes Tribals*. 2(1): 37- 44.
- Muhiye, M.G. (2007). Characterization of smallholder poultry production and marketing system of dale, Wonsho and Loka Abaya Weredas of Southern Ethiopia. M.Sc. Thesis, Department of Animal and Range Sciences, Awassa College of Agriculture. School of Graduate Studies Hawassa University Awassa, Ethiopia.
- Mishra, S., Tailor, S., Gupta, L., Bugaliya, H. and Dangi, B. (2019). Characteristics of local chicken birds from southern Rajasthan Region. *International Journal of Livestock Research*. 9(5): 120-127.
- Mishra, S., Tailor, S.P. and Dangi, B.L. (2009). Status paper on rural poultry in Rajasthan. Unpublished report submitted to Rajasthan college of Agriculture, MPUAT, Udaipur, Rajasthan (India). pp-1-50.
- Naik, M.R., Umesh, H., Reddy, M.B., Manta, M. and Ramanjaneyulu, A.V. (2022). Status and Prospects of Organic Farming in India. *Chronicle of Bioresource Management- An International E-magazine*. 6(2): 60-65.

- Nath, B.G., Pathak, P.K. and Mohanty, A.K. (2012). Constraints analysis of poultry production at Dzongu Area of North Sikkim in India. *Iranian Journal of Applied Animal Science*. 2(4): 397-401.
- Oyeyinka, R.A., Raheem, W.K., Ayanda, I.F. and Abiona, B.G. (2011). Poultry farmers awareness and knowledge of improved production practices in Afijio, local government area, Oyo state, Nigeria. *International Journal of Agricultural Economics and Rural Development*. 5(1): 74-82.
- Oladunni, M.E. and Fatuase, A.I. (2014). Economic analysis of backyard poultry farming in Akoko North West Local government area of Ondo State, Nigeria. *Global Journal of Biology, Agriculture and Health Sciences*. 3(1): 141-147.
- Onyia, C.C., Okpukpara, B.C. and Onyekuru, A. (2022). Economics of Poultry Waste Management Policy in South East Nigeria: Exploring the determinants using choice experiment model. *Agricultural Science Digest*. 42(4): 494-499. doi: 10.18805/ag.DF-444.
- Pandey, M., Kumar, S., Chandrahas, A.K., Chaudhari, C.P., Kanadkhedkar, H.L. and Meena, R. (2022). Comparative study of growth and layer economic traits in Aseel and Kadaknath Chicken breeds under intensive rearing system. *The Pharma Innovation Journal*. SP 11(6): 1553-1557.
- Pralhad, G.S., Yadahalli, Nagaraj, Sreedhara, J.N., Anupama, C., Shreevani, G.N. and Patil, M.C. (2020). Impact of KVK trainings on promotion of backyard poultry farming in Kalyan-Karnataka. *International Journal of Current Microbiology and Applied Sciences*. 9(6): 92319-7706.
- Rahman, S. (2017). Status and constraints of backyard poultry farming in Mizoram. *Indian Journal of Hill Farming*. SI: pp-76-82.
- Sharma, S. (2021). Impact of attracting and retaining youth in agriculture (ARYA) project on goat and poultry farming in Banswara district of Rajasthan. Ph.D Thesis submitted to Department of Extension Education, Rajasthan college of Agriculture, MPUAT, Udaipur, 313001 (India).
- Samantaray, S.K., Ranabijuli, S., Mohanty, B., Satapathy, B., Panda, P.K. and Behera, M.R. (2020). Adoption level of scientific backyard poultry practices: A socio-technical analysis in the state of Odisha. *The Pharma Innovation Journal*. SP-9(8): 104-108.
- Sankhyan, V., Katoch, S., Thakur, Y.P., Dinesh, K., Patial, S. and Bhardwaj, N. (2013). Analysis of characteristics and improvement strategies of rural poultry farming in north western Himalayan state of Himachal Pradesh, India. *Livestock Research for Rural Development*. 25(12): 1-11.
- Sharma, H., Preeti, R.K., Thakur, M., Kour, J. and Reen, M.S.B. (2018). Study of managerial practices of backyard poultry in Jammu district of Jammu and Kashmir. *The Pharma Innovation Journal*. 7(7): 927-932.
- Siddiky, N.A., Islam, S., Sarker, M.S., Begum, R. and Samad, M.A. (2022). Knowledge, attitude and practices of poultry farmers on antimicrobial use, resistance and farm hygiene management in Bangladesh. *Research Square*. 1-25.
- Sihag, P. (2020). Knowledge and adoption level of beneficiaries of backyard poultry project operated by SKNAU, Jobner, Jaipur. M. Sc. (Ag.) Thesis submitted to Department of Extension Education, Shree Karan Narendra Agricultural University, Jobner, Jaipur, Rajasthan (India).
- Toor, J.S. and Goel, R. (2024). Poultry farming in India with special reference to Punjab: An Overview. *Agricultural Science Digest*. 44(6): 1000-1004. doi: 10.18805/ag.D-5540.
- Tsegaye, B., Gudina, T.V. and Alemseged, H.N. (2014). Evaluation of management practices and marketing systems of village chicken in Ethiopia. *African Journal of Tropical Agriculture*, 2(10): 105-110.
- Varadharajan, A. and Gnanasekar, R. (2019). Analysis of backyard poultry farming in Cuddalore district of Tamil Nadu, India: Implication for sustainable rural development. *Asian Journal of Research in Animal and Veterinary Sciences*. 4(4): 1-6.
- Verma, R.K. (2014). An ethnobotanical study of plants used for the treatment of livestock diseases in Tikamgarh District of Bundelkhand, Central India. *Asian Pacific Journal of Tropical Biomedicine*. 4: 460-467.
- Vineetha, P.G., Shamna, T.P. and Prasoon, S. (2021). Documentation of indigenous traditional knowledge (ITKs) system used in poultry disease management prevalent among the farmers of Palakkad district, Kerala. *Conference: Kerala Veterinary Science Congress-2021*: pp-301-303.
- Weyuma, H., Singh, H. and Megersa, M. (2015). Studies on management practices and constraints of back yard chicken production in selected rural areas of Bishoftu. *Journal of Veterinary Science & Technology*, SP12(3): 2-9. doi:10.4172/2157-7579.1000S12-003.