

Livestock Healthcare and Farmer Contentment: An Exploration of Economic and Social Determinants

Menaka C^{1*}, Dr. B G Kulkarni², Nidhi Saraswat³

^{*1}Associate Professor, Department of Computer Science and Information Technology, Jain (Deemed to be University), Bangalore, India, Email Id- c.menaka@jainuniversity.ac.in, Orcid Id- 0000-0002-0774-1149

²Professor, Department of Shareera Rachana (Anatomy), Parul Institute of Ayurved and Research, Parul University, Vadodara, Gujarat, India, Email Id- bhagawan.kulkarni@paruluniversity.ac.in, Orcid Id- 0000-0002-7258-7109

³Assistant Professor, Department of Computer Science & Engineering, Sanskriti University, Mathura, Uttar Pradesh, India, Email Id- nidhi.soeit@sanskriti.edu.in, Orcid Id- 0009-0006-8861-5342

Abstract

Livestock production is essential to global agriculture, greatly contributing to food safety and regional economies. Sustainable agricultural operations must ensure the health and well-being of animals. This study investigates the complex connection between livestock healthcare and farmer satisfaction, considering the economic and social factors that impact this dynamic association. A growing number of stakeholders are concerned about the effective delivery of minor veterinary treatments due to India's severe workforce deficit in providing animal health care. The study intends to determine farmers' satisfaction with Para-veterinary assistance across four Indian states: Andhra Pradesh, Uttarakhand, Himachal Pradesh, and Assam. The study compared weighted mean values across different states to assess and rank satisfaction with basic veterinarian treatments. Pearson's product-moment correlation study showed some intriguing results. Notably, there was a negative relationship between farmers' education levels and their satisfaction with Para-veterinary treatments. There was a positive relationship between the distance from the veterinarian hospital/dispensary and farmer satisfaction. The satisfaction of farmers with modest veterinary services was shown to be correlated with age and landholding. According to the findings, 55.48 percent of respondents expressed a moderate degree of satisfaction with Para-veterinary solutions, while 45.72 percent of participants expressed a high degree of satisfaction. Furthermore, farmers who were more satisfied with the health of their animals were satisfied with their farming experience overall. Addressing these characteristics is ultimately necessary for fostering ecological livestock farming techniques and improving the overall well-being of livestock and farmers.

Keywords: Livestock Productivity, Farmers, Agricultural Policy, Rural Well-being, Economic and Social Determinants

INTRODUCTION

The livestock production is an important part of the global agricultural system and a major source of income and nutrition for millions of farmers throughout the world. It can be the forecast is challenging to distinguish between the interests of stakeholders and producers (1). The health of livestock is closely related to farmers' financial and social pleasure, which means that healthcare procedures, economic variables, and the general well-being of those working in the livestock business interact (2). The housing and environment, nutritional and health programs, handling and caregiver relationships, animal group dynamics, and standard management methods are a variables that affect the health and well-being of animals in industrial manufacturing systems. The scientific community has a significant task in trying to reduce food losses, sustainably raise agricultural productivity, and uphold strict standards for the health and welfare of animals as the world's population grows (3). One of the most important groups for ensuring that the new farm animal welfare (FAW) standards are implemented successfully is the farming community. An increasing amount of study has been conducted since Seabrook's work on the human-animal bond (HAR).

The exploration aims to improve future programs that will be utilized to implement FAW by examining farmers' opinions about these issues (4). The creation of extension programs, regulations, and management measures targeted at preserving healthy animals can be made more successful with more knowledge of farmers' views and values (5). As well, farmers' sense of general well-being and happiness are closely related to each other and heavily impacted by the stability and profitability of their farming operations. By considering the financial aspects that influence farmers' capacity to spend on animal health, the complex link between farmer satisfaction and livestock healthcare. The implications of animal health on human society and the connection between animal health and the overall welfare of individuals which deal with animals (6). To provide useful data that can guide practices, rules, and interventions targeted at supporting livestock producers' sustainable and satisfying livelihoods, their hope to become well understanding of these complex relationships. Collaborate to develop focused interventions that support sustainable agriculture, improve living conditions, and improve the general well-being of rural communities by having a greater understanding of the factors that affect the health of livestock and farmer satisfaction (7).

The study (8) provided a foundation for deciphering the intricacies of farmer satisfaction and livestock healthcare, promoting a comprehensive approach to the possibilities and difficulties in the ever-changing field of livestock farming. The study (9) investigated the relationships between Norwegian sheep farmers' job satisfaction and physical work environment perception, work motivation, management routine performance, and the portion of farming that generates their revenue, among other work-related characteristics. The article (10) determined and emphasizes the importance of encouraging stakeholder involvement and multidisciplinary collaboration even further. The study makes recommendations to enhance FAW, including instruments to help farmers modify their behavior. The study (11) determined that small-scale business ventures might increase rural households' incomes and contribute to a widespread reduction in rural poverty. The article (12) strengthened the case for including animal welfare into climate change and sustainability policies, as well as impacted the development of private agri-food standards. Nonetheless, an abundance of evidence indicates that farmers prioritize minimizing adverse effects. The paper (13) offered novel approaches for gathering large-scale emotional data from farm animals. These methods can be utilized to teach Artificial Intelligence (AI) systems that can recognize, quantify, and predict the emotional states of individual cows and pigs. The study (14) explored how real-time data from Internet of things (IoT)-enabled sensors might offer insightful information on the movements, grazing habits, and social activities of livestock. These insights help ranchers and farmers allocate resources optimally, improving the health of their herds and their total output. The paper (15) defined measurements of good well-being and no scientifically confirmed benchmarks for assessing the fleeting emotional (affective) states of farm animals; instead, there are only signs of low welfare, such as pain, damage, and fear. The study (16) conducted to investigate the effects of Chronic Kidney Disease (CKD) on patients as well as their families, as there is insufficient evidence to understand the impact of the expanding health danger on afflicted individuals. The work of (17) determined scoping study set aimed to establish the study's global scope, explain the literature analytically to explain the findings on mental well-being in agricultural people, and list published mental health treatments and services that have been evaluated. The study (18) associated with work hazards, which also impact other farm family members who reside on the property and frequently participate in the labor, farmers' health is at risk; Farmers have a greater socioeconomic position, a lower smoking prevalence, and an active lifestyle.

The rest of the paper is organized as follows: data gathering and supporting procedures are covered in Section 2. The debate and outcome were the main topics of Section 3, while the conclusion was covered in Section 4.

METHODOLOGY

The study was carried out in Assam, Andhra Pradesh, Uttarakhand, and Himachal Pradesh, four states in India. The highest number of cattle, the number of para-vet educational institutions, and the state's standing in terms of milk

production among all of India's states were used as selection criteria. The district was chosen because it has the most para-veterinary facilities in comparison to other state districts. A random sample approach was used to identify dairy producers who had at least two cows and had been using para veterinary services as responders for at least two years. To assess the statistical connection or association between farmers' socioeconomic characteristics and their degree of contentment with para-veterinary services made possible by the Pearson correlation between product moments. The four districts chosen for the study were compared using a weighted mean score to determine how satisfied farmers were the main para-veterinary service roles. The following Equation (1) was used to get the weighted mean score:

$$b_x = \Sigma nX / X \quad (1)$$

In this case, nX =Products for Weight and Measurement, X =The sum of the observations, and b_x =Weighted mean Score (WMS).

Statistical techniques

The executing explores with non-transformed response variables and, where applicable related non-parametric tests allowed examining the impact of transformations. The changes had no impact on the conclusions; paired missing values were not included in the statistical analysis. They used correlation analysis (Pearson's correlation coefficient) and one-tailed t-tests to determine if the piglet production parameters deviated from the population mean to assess the representativeness of the research sample. The sampled farmer had distinctly good attitudes toward improving animal welfare to determine the number of piglet above or below the population's mean is related with a given perspective. They selected the instances for these samples based on a visual inspection of the distributions since there was a significant variance in the farmers' response across the various questions. When analyzing the associations between the production metrics and the perspective components between the various attitude components, the utilized partial associations with gender categories and farm size as controlling variables to remove the unfairness by differing distributions.

RESULT AND DISCUSSION

The three major methods were used by para-vets to manage parasites: dips, injections, and tablets. A total of 20 percent of para-vets chose injection mode, whereas 95.72 percent selected dip (or) spray for tick and mite treatment. In the purpose of controlling end parasites and worms, all para-vets administered medications orally (tablets) and injectable (90.00). In contrast, 73.85 percent of para-vets chose the injection ectoparasitic worm technique, while 46.35 percent chose dipping; the dipping (or) spraying method of fly control was preferred by all responders. Animals become less immune to infections including Foot and Mouth Disease (FMD) and brucellosis if the recommended immunization schedule is not followed. Table (1) shows the techniques of para-vets chosen for managing parasites infestation.

Table (1). Diverse techniques that para-vets choose for managing parasites infestation

(Source: Author)

Insect parasites	Approach to control		
	Injection	Dip/spray	Tablets
Mites and ticks	26 (20.00)	140 (95.72)	12 (08.45)
Insect (Endo-parasites)	10 (12.00)	10 (15.00)	120 (90.00)
Insect (Ecto-parasites)	116 (73.85)	68 (46.35)	02 (04.08)

Flying insects	10 (13.00)	170 (120.0)	06(09.07)
----------------	------------	-------------	-----------

An examination showed that para-vets' knowledge of breeds other than Jersey had the lowest color-coding of semen straw, including buffalo, indigenous cattle, and HF. It was discovered that, 73.62, 68.62, and 71.75 percent of para-vets knew straw-related colors for HF, native cattle, and buffalo. Because more farmers were seeking the Jersey breed in Assam, Andhra Pradesh, Uttarakhand, and Himachal Pradesh, the explanation for their poor knowledge (48.22%) of the breed's color code was this. The straw's color coding was found to be (66.47%) and lowly (48.22%) conscious in response to the moderate need for HF CB fertilizer straw and the low need for Jersey straw respectively. Table (2) shows the para-vet of perspective.

Table (2). Observe to para-vet perspective

(Source: Author)

Category	Straw hue	Awareness
Buffalo	Gray	106(71.75)
Indigenous cattle	Orange	101(68.62)
Jersey	Yellow	51(48.22)
HF GB	Light green	85(66.47)
Holstein	Pink/Rose	112(71.75)

The 55.02 percent of farmers in the research region were satisfied to extremely satisfied with artificial insemination, while 35.35 percent of respondents were satisfied to moderate degree. For the diagnosis of pregnancy, around 60.00 percent of participants reported amoderate to extremely high level of feeling satisfied, whereas 20.00 percent indicatedan extremely low degree of work satisfaction. Including deworming treatments and vaccination, over 55 percent of farmers reported very satisfied to extremely satisfy with these services. The majority of stakeholders believed that para-vets were highly skilled and performing an acceptable job in services including medical care, vaccination, and worm treatment. The average degree of satisfaction with minor surgical procedures was observed, around 55% of farmers reporting poor to low levels of satisfaction with their roles,after that very high satisfaction was reported by 60.00 percent of farmers.Using procedures for castration percentage of farmers that reported being extremely or very satisfied with castration services. Findings similar to these highlighted the need for professional staff introduction and ongoing training to preserve confidence in the agricultural community.The outcomes of farmers' satisfaction with important services are displayed in Table (3) and Figure (1).

Table (3). Farmers' satisfaction with primary services provided by para-vets

(Source: Author)

Functions and services	High	Moderate	Low
Diagnose for pregnancy	50.00%	30.00%	20.00%
Animal castration	39.50%	35.30%	25.20%
Anthelmintic treatment	60.00%	20.00%	20.00%
Immunization	40.00%	35.00%	25.00%

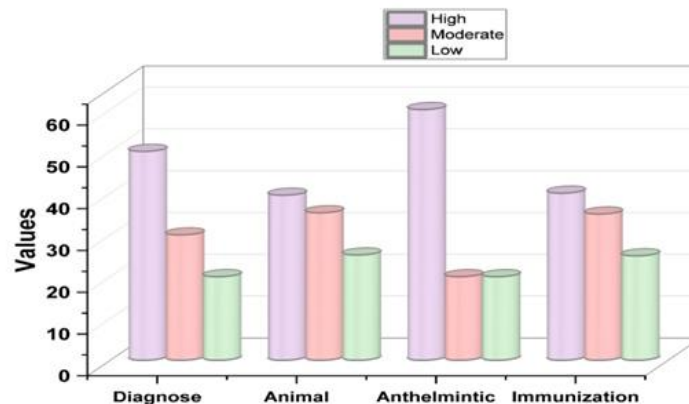


Figure (1). Outcome of Farmers' satisfaction with primary services

(Source: Author)

As measured by customer satisfaction, services came in first place, with deworming and vaccination coming in second and third on a continuum predicated on the weighted mean scores for the satisfied requirements. Based on the geometric mean score, it was discovered that farmers considered the diagnosis of pregnancy as the fourth most satisfying experience, after that, minor surgical procedures and castration, in that sequence. The least satisfied farmers were the para-vets providing advice and extension services, accounting for the lowest ranking between the seven types of jobs and services. It has been determined how satisfied farmers have many responsibilities and services that para-vets work in the general category of veterinary services that are miniature. Analysis showed that Immunization of total weighted mean score (40.14), followed by animal castration (77.49). The diagnosis for pregnancy (42.04), followed by vaccination (43.32), with the highest ratings in this, the weighted mean scores across the respondents from different districts vary considerably. Weighted mean evaluations were at a moderate level for the diagnosis of pregnancy and castration services, indicating that respondents' satisfaction with para-veterinary services was average as demonstrated in Figure (2) and Table (4). Milk cooperatives, which were used by farmers with sizable herds and stable socioeconomic conditions, frequently provided para-veterinary services. Small surgical procedures, role extensions, and advisory tasks, which came in second and last, respectively, were rated by farmers. The farmers' satisfaction with extension and advisory services was below average, with nearly half expressing poor levels of satisfaction. Therefore, it can be observed, while taking into the primary responsibilities and services provided by para-vets, farmers' contentment and minor surgical treatment were deemed low importance.

Table (4). Weighted average results performed by para-vets

(Source: Author)

Principal functions and services	Assam	Andhra Pradesh	Uttarakhand	Himachal Pradesh	Overall
Diagnose for pregnancy	09.42	12.15	10.15	10.32	42.04
Animal castration	08.70	7.15	13.00	12.94	77.49
Anthelmintic treatment	09.72	8.60	15.70	09.30	43.32

Immunization	09.80	09.72	09.72	10.90	40.14
--------------	-------	-------	-------	-------	-------

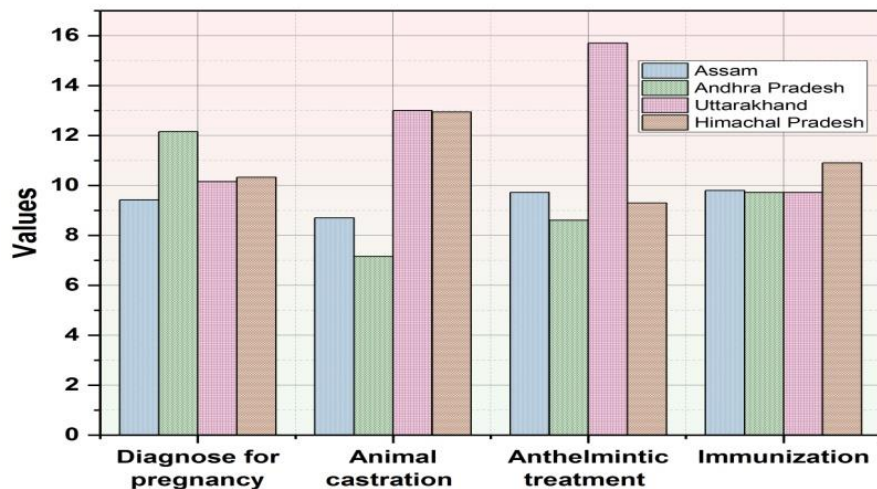


Figure (2). Outcome of weighted average results

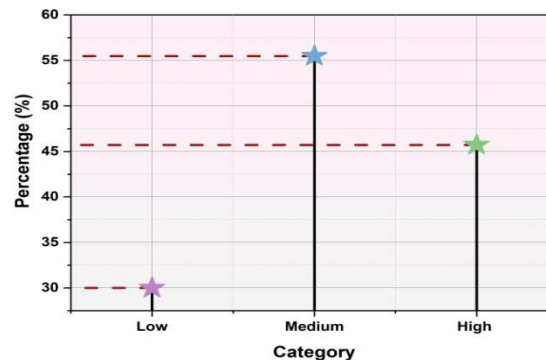
(Source: Author)

It was discovered that around 55.48 percent of respondents were classified as somewhat satisfied, and 45.72 percent of respondents were classified as highly happy with para veterinary services. However, 30.00 percent of those surveyed expressed dissatisfaction with the para-veterinary care they received. Farmers were required to respond to seven duties about minor veterinarian care, in a holistic manner which could have contributed to nearly half of the respondents' medium level of satisfaction as exposed in Figure (3) and Table (5). The degree of pleasure would decrease, nevertheless, after analyzing the elements, accountability, and obligation under each work, as farmers would disclose the para-vets' lack of proficiency in numerous task facets.

Table (5). Respondent classification

(Source: Author)

Category	Frequency	Percentage (%)
Low	42	30.00
Medium	81	55.48
High	67	45.72

**Figure (3).** Outcome of respondent classification

(Source: Author)

Based on the outcomes of Pearson's product-moment correlation, among the different socioeconomic characteristics that were presented, the degree of farmers' satisfaction with para-veterinary services was significantly correlated with their educational histories and isolation from the vet clinic or pharmacy. This result was consistent with the findings of those who found that the most significant when providing animal health services, distance was the transaction expense; the cost of veterinary treatment drops with increasing distance to veterinary providers. The need for para-veterinary services is growing, which is the person's test indicated a substantial rise in demand for these services. That indicates farmers were happier with para-veterinary services the less educated they were and the farthest lived from veterinary clinics. Age and possession of land of the respondents, however, did not appear to have a significant correlation with satisfied they were para-veterinary care. The socioeconomic factors and degree of satisfaction are shown in Table (6).

Table (6). Socio-economic factors and degree of satisfaction

(Source: Author)

Farmers socioeconomic characteristics	R-importance	Relevance (p-Importance)
Age	0.424	0.678
Qualifications in education	0.627	0.052
Land Possession	0.302	0.678
The distance from the veterinarian clinic	0.682	0.063

CONCLUSION

The most important need for para-veterinary services that can be capable and responsible for the responsibilities given to them as part of the minimal veterinary services. The purpose of the study is to determine farmers' satisfaction levels with para-vets' animal husbandry services. The association between agricultural producers' socioeconomic profile and their degree of satisfaction in para-veterinary treatments was examined using Pearson's product-moment correlation. Among the socioeconomic variables, farmers' education was shown to be

correlated with how satisfied they were with para-veterinary services, however, there was a positive association identified in their separation from a veterinarian's facility or dispensary. Investigators discovered that farmers' satisfaction with minor veterinarian services was not correlated with their age or amount of land. A considerable portion of farmers (44.38%) expressed contentment with para-veterinary services when the total satisfaction with these services. Therefore, it can be assumed that para-veterinary treatments require current supervision and evaluation to take stakeholder viewpoints into account in a participatory way. To create a beneficial connection between the supply and demand for par veterinary support, policy imperatives should take into the opinions of para-vets between all of the vendors in the animal health care system. Additionally, there should be consideration given to the possibility of veterinarians monitoring and providing supervisory support to ensure that prompt and efficient services are provided to farmers. Future studies might focus on precision medicine, remote monitoring, and policy measures to improve the health of cattle and the contentment of farmers.

REFERENCE

- [1] Ghosh, S., Mukherjee, A., Kumar, U., Upadhyaya, A., & Sontakki, B. S. (2023). Finding bliss in the fields: an exploration of happiness factors of Indian farmers. *CURRENT SCIENCE*, 125(4), 369. Doi: [10.18520/cs/v125/i4/369-376](https://doi.org/10.18520/cs/v125/i4/369-376)
- [2] Grant, N., Buchanan, H., & Brennan, M. L. (2023). Factors within A Veterinarian-Cattle Farmer Relationship That May Impact on Biosecurity Being Carried out on Farms: An Exploratory Study. *Veterinary Sciences*, 10(7), 410. Doi: [10.3390/vetsci10070410](https://doi.org/10.3390/vetsci10070410)
- [3] Li, J., Ma, W., & Gong, B. (2023). Market participation and subjective well-being of maize farmers. *Economic Analysis and Policy*, 80, 941-960. Doi: [10.1016/j.eap.2023.09.037](https://doi.org/10.1016/j.eap.2023.09.037)
- [4] Maposa, L., Garwe, E., & Nyamushamba, G. G. (2023). Factors Influencing Smallholder Farmers' Preference for Veterinary Services Providers in Zimbabwe. *Qeios*. Doi: [10.32388/3ZKNHD](https://doi.org/10.32388/3ZKNHD)
- [5] Schanz, L., Oehen, B., Benoit, M., Bernes, G., Magne, M. A., Martin, G., & Winckler, C. (2023). High work satisfaction despite high workload among European organic mixed livestock farmers: a mixed-method approach. *Agronomy for Sustainable Development*, 43(1), 4. Doi: [10.1007/s13593-022-00852-x](https://doi.org/10.1007/s13593-022-00852-x)
- [6] Schriber-Hannah, C. (2023). The relaxed livestock farmer: The effect of coping strategies and leisure activities on farmer wellbeing and stress (Doctoral dissertation, The University of Waikato). Doi: [10.289/16081](https://doi.org/10.289/16081)
- [7] Hansen, B. G., Langseth, E., & Berge, C. (2023). Animal welfare and cow-calf contact-farmers' attitudes, experiences and adoption barriers. *Journal of Rural Studies*, 97, 34-46. Doi: [10.1016/j.jrurstud.2022.11.013](https://doi.org/10.1016/j.jrurstud.2022.11.013)
- [8] Drewry, J. L., Shutske, J. M., Trechter, D., Luck, B. D., & Pitman, L. (2019). Assessment of digital technology adoption and access barriers among crop, dairy and livestock producers in Wisconsin. *Computers and Electronics in Agriculture*, 165, 104960. Doi: [10.1016/j.compag.2019.104960](https://doi.org/10.1016/j.compag.2019.104960)
- [9] Daghigh Yazd, S., Wheeler, S. A., & Zuo, A. (2019). Key risk factors affecting farmers' mental health: A systematic review. *International journal of environmental research and public health*, 16(23), 4849. Doi: [10.3390/ijerph16234849](https://doi.org/10.3390/ijerph16234849)
- [10] Muri, K., Tufte, P. A., Coleman, G., & Moe, R. O. (2020). Exploring work-related characteristics as predictors of norwegian sheep farmers' affective job satisfaction. *Sociologia Ruralis*, 60(3), 574-595. Doi: [10.1111/soru.12299](https://doi.org/10.1111/soru.12299)
- [11] Balzani, A., & Hanlon, A. (2020). Factors that influence farmers' views on farm animal welfare: A semi-systematic review and thematic analysis. *Animals*, 10(9), 1524. Doi: [10.3390/ani10091524](https://doi.org/10.3390/ani10091524)
- [12] Waheed, A., Faraz, A., & Ishaq, H. M. (2020). A Study of Problems of Rural Farmers Keeping Desi Poultry in Southern Punjab. *Punjab University Journal of Zoology*, 35(2), 191-194. Doi: [10.17582/journal.pujz/2020.35.2.191.194](https://doi.org/10.17582/journal.pujz/2020.35.2.191.194)
- [13] Vigers, B., Ewing, D. A., & Lawrence, A. B. (2021). The importance of farm animal health and natural behaviors to livestock farmers: findings from a factorial survey using vignettes. *Frontiers in Animal Science*, 2, 638782. Doi: [10.3389/fanim.2021.638782](https://doi.org/10.3389/fanim.2021.638782)
- [14] Park, J. H., & Han, M. H. (2023). Enhancing livestock management with IoT-based wireless sensor networks: a comprehensive approach for health monitoring, location tracking, behavior analysis, and environmental optimization. *Journal of Sustainable Urban Futures*, 13(6), 34-46. Doi: [10.54112/bcsrj.v2023i1.442](https://doi.org/10.54112/bcsrj.v2023i1.442)
- [15] Neethirajan, S. (2022). Affective State Recognition in Livestock-Artificial Intelligence Approaches. *Animals: an Open Access Journal From MDPI*, 12(6), 759-759. Doi: [10.3390/ani12060759](https://doi.org/10.3390/ani12060759)

- [16] Liyanage, C. (2019). Burden of chronic kidney disease of uncertain etiology on families of patients and their coping behaviour in two farming communities in Sri Lanka. *Journal of Social Sciences and Humanities Review*, 4(1), 27. Doi: [10.18461/jjfsd.v14i2.F4](https://doi.org/10.18461/jjfsd.v14i2.F4)
- [17] Hagen, B. N., Albright, A., Sargeant, J., Winder, C. B., Harper, S. L., O'Sullivan, T. L., & Jones-Bitton, A. (2019). Research trends in farmers' mental health: A scoping review of mental health outcomes and interventions among farming populations worldwide. *PLoS one*, 14(12), e0225661. Doi: [10.1371/journal.pone.0225661](https://doi.org/10.1371/journal.pone.0225661)
- [18] Jones, C. A., Parker, T. S., Ahearn, M. C., Mishra, A. K., & Variyam, J. N. (2009). Health status and health care access of farm and rural populations (No. 1476-2016-121002). Doi: [10.22004/ag.econ.54430](https://doi.org/10.22004/ag.econ.54430)