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Knowledge change and adoption of recommended poultry farming practices among rural youth trained under ARYA project

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ABSTRACT

The present study assessed the change in technical knowledge and the adoption of recommended poultry farming practices among rural youth trained under the ARYA programme. The study was conducted in six selected Krishi Vigyan Kendras where ARYA activities were operational and poultry was promoted as an enterprise through training programmes. A total of 200 rural youth who had participated in poultry enterprise training were selected as respondents. Knowledge was assessed using objective questions before and after the intervention, whereas adoption was measured on a three-point continuum. The results showed a consistent improvement in knowledge across all ten selected areas of poultry management. Pre-training knowledge ranged from 21.0 to 38.0 per cent, while post-training knowledge increased to 67.5-87.0 per cent, representing gains of 46.0-55.0 percentage points. The largest gain was observed for vaccination and disease prevention (55.0 percentage points), followed by disease identification and control (54.0 points). Adoption was also substantial, with an overall adoption index of 77.3 per cent. Balanced feeding and clean drinking water recorded the highest adoption index (86.5%), followed by clean and adequately ventilated housing (84.5%) and daily monitoring of birds (82.5%). Comparatively lower adoption was observed for record keeping (63.8%), ectoparasite, rodent and pest control (69.8%), and hygienic handling and storage of eggs/meat (72.3%). The findings indicate that structured technical training can substantially strengthen knowledge and support the adoption of scientific poultry management practices among trained rural youth. Continued mentoring, demonstrations and follow-up support are particularly relevant for practices requiring systematic documentation, repeated monitoring and additional resources.

Keywords: Poultry farming, Knowledge gain, Adoption and enterprise development

Introduction

Poultry farming is an important allied agricultural enterprise because it provides opportunities for production of eggs and meat and can be undertaken by rural households and emerging rural entrepreneurs at different scales. Scientific management, however, requires knowledge of breed selection, housing, ventilation, feeding, brooding, vaccination, disease prevention, biosecurity, product handling and record keeping. The effectiveness of poultry enterprise development therefore depends not only on access to production resources but also on the capacity of entrepreneurs to apply recommended practices.

The ARYA programme provides an enterprise-development orientation for rural youth, with training and technical support intended to strengthen their capacity to undertake income-generating agricultural and allied activities. In the present study, poultry was promoted as an enterprise through training programmes implemented through selected Krishi Vigyan Kendras. The study therefore examined two complementary dimensions of enterprise development: improvement in technical knowledge following training and the extent to which recommended poultry practices were adopted by trained youth.

Earlier Indian research provides a useful basis for examining this relationship between training, knowledge and adoption. Mandavkar *et al.* (2020) [1], studying trained poultry farmers in Raigad, reported good knowledge in brooding, ventilation and lighting, water management and feed management, with relatively high adoption of several corresponding practices. Sharma *et al.* (2024) [2] reported significant knowledge gains after long-duration poultry training in Himachal Pradesh and observed positive changes in adoption of recommended practices. Jat *et al.* (2012) [3] also reported that registered poultry farmers showed greater adoption of recommended scientific practices and associated this pattern with training and exposure.

More recent evidence has further highlighted the importance of training for biosecurity-related knowledge and behaviour. Alagesan *et al.* (2025) [4] found significant pre- to post-training knowledge gains among commercial poultry farmers in Tamil Nadu across structural and operational biosecurity areas, with adoption behaviour also increasing after follow-up in most assessed categories. Research from Uttar Pradesh has like

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wise reported that knowledge, training and other socioeconomic factors were associated with actual implementation of farm biosecurity practices.

Against this background, the present study assessed the change in knowledge and adoption among 200 rural youth trained under ARYA. The knowledge assessment covered ten technical dimensions of poultry farming, while adoption was examined for ten recommended management practices. The results provide evidence for identifying areas where training appears to have produced substantial improvement as well as practices where continued extension and mentoring may be required.

Objectives of the study

1. To assess the level of knowledge of rural youth regarding selected scientific poultry farming practices before and after training.
2. To ascertain the extent of adoption of recommended poultry farming practices among trained rural youth.

Methodology

The study was conducted in the selected Krishi Vigyan Kendra viz., Ghazipur-I, Shaharanpur, Deoria, Pratapgarh, Kausambhi, Muzaffarnagar-I and Gorakhpur-I, where the ARYA project was operational and poultry was promoted as an enterprise through training

programme. These KVKs were purposively selected based on the implementation of ARYA activities and availability of poultry related training for rural youth.

A total of 6 KVKs were selected for the study and 200 rural youth who had participated in poultry enterprise training under ARYA were selected as respondents. Data were collected through a structured interview schedule covering socio-economic characteristics, knowledge, and adoption of poultry practices. Knowledge was assessed using objective questions analyzed by frequency and percentage method, while for adoption respondents answers were recorded on three-point continuum, with the values of 2, 1 and 0 for always, sometimes and never respectively. Based on the mean and standard deviation of their scores in various adoption elements and total adoption and the respondents were divided into three adoption categories: low, medium and high.

Results and discussions

Table 1 presents the change in knowledge of 200 respondents regarding ten important poultry farming practices before and after the intervention/training. The findings show a clear improvement in knowledge across all the selected dimensions. The pre-knowledge percentages ranged from 21.0 to 38.0 per cent, whereas post-knowledge increased to 67.5-87.0 per cent. The improvement ranged from 46.0 to 55.0 percentage points, indicating a substantial increase in respondents' understanding of scientific poultry management.

Table 1. Distribution of respondents based on Change in Level of Knowledge Regarding Poultry Farming Practices ($n = 200$)

S. No.	Knowledge criterion	Pre-knowledgen (%)	Post-knowledgen (%)	Change in knowledge (percentage points)
1	Basic poultry breeds and selection of suitable birds	71 (35.5)	166 (83.0)	+47.5
2	Scientific housing, ventilation and sanitation	64 (32.0)	170 (85.0)	+53.0
3	Balanced feeding and clean drinking water	76 (38.0)	174 (87.0)	+49.0
4	Brooding, chick management and temperature control	58 (29.0)	158 (79.0)	+50.0
5	Vaccination schedule and disease prevention	52 (26.0)	162 (81.0)	+55.0
6	Biosecurity, hygiene and visitor control	45 (22.5)	151 (75.5)	+53.0
7	Identification and control of common poultry diseases	49 (24.5)	157 (78.5)	+54.0
8	Litter management and disposal of dead birds	57 (28.5)	149 (74.5)	+46.0
9	Egg/meat production, handling and storage	61 (30.5)	153 (76.5)	+46.0
10	Record keeping, marketing and economics	42 (21.0)	135 (67.5)	+46.5

Before the intervention, only 35.5 per cent of respondents possessed knowledge about basic poultry breeds and selection of suitable birds. This increased to 83.0 per cent after the intervention, representing a gain of 47.5 percentage points. The improvement suggests that exposure to technical information helped respondents understand breed characteristics and the importance of selecting birds appropriate to the production objective. This finding is supported by research conducted in Uttar Pradesh, where scientific knowledge of poultry farmers was assessed across areas including breed selection, housing, feeding, brooding, biosecurity and disease management. The study demonstrated that knowledge varied considerably across these technical components, highlighting the importance of systematic technical education in poultry production. Knowledge increased from 32.0 per cent before intervention to 85.0 per cent after intervention, giving a gain of 53.0 percentage points. This relatively large improvement indicates that respondents developed a better understanding of the importance of proper housing design, ventilation and sanitation (Pratap *et al.*,

2016) [5]. This improvement is in line with Kumar *et al.* (2021), who documented variation in farmers' knowledge across backyard poultry components, including breeding, and emphasized the relevance of technical awareness for appropriate poultry management.

Scientific housing is fundamental because poor ventilation and inadequate sanitation can increase environmental stress and disease risk. A study of poultry farmers in Raigad reported comparatively good knowledge and adoption regarding ventilation and lighting, while proper management of poultry houses was also among the practices followed by trained farmers. Knowledge regarding balanced feeding and clean drinking water increased from 38.0 to 87.0 per cent, resulting in a 49.0 percentage-point gain. The relatively high post-knowledge level indicates that respondents became more aware of the relationship between appropriate nutrition, water quality and poultry performance. Similar observations were reported by Nikam *et al.* (2020) [

[6] who found good knowledge regarding water and feed management among poultry farmers in Raigad. Their findings also showed substantial adoption of balanced feeding and appropriate health-care practices. This finding is supported by Bunkar *et al.* (2021), who assessed knowledge of recommended poultry farming practices and documented measurable knowledge across major feeding and management components.

Knowledge improved from 29.0 to 79.0 per cent, corresponding to a 50.0 percentage-point increase. This indicates that the intervention substantially improved respondents' understanding of brooding conditions, chick care and temperature regulation. The finding is consistent with the work of Mandavkar *et al.* (2020) [1], where brooding management was one of the areas in which poultry farmers demonstrated comparatively good knowledge and adoption. The proportion of respondents having knowledge about vaccination and disease prevention increased from 26.0 per cent before intervention to 81.0 per cent after intervention. The 55.0 percentage-point gain was the highest among all ten knowledge areas. This substantial improvement may reflect the practical importance of vaccination in poultry production and the emphasis normally given to disease prevention during poultry training. A recent training intervention among commercial poultry farmers in Tamil Nadu reported significant knowledge gains following training in disease and vaccine-related biosecurity components. Similarly, Mandavkar *et al.* (2020) [1] reported that more than two-thirds of the studied poultry farmers followed vaccination schedules, indicating the relevance of vaccination knowledge to actual poultry management. Similar emphasis on scientific chick and poultry management has been reported by Sihag *et al.* (2021) [7], who assessed beneficiaries' knowledge of recommended backyard poultry practices. The importance of training in disease management is also supported by Kumar *et al.* (2012) [8], who reported that disease management of chicks was the most important training area and observed substantial knowledge gain following training.

Knowledge increased from 22.5 to 75.5 per cent, resulting in a 53.0 percentage-point gain. The relatively low initial level suggests that biosecurity was an important knowledge gap before intervention. The substantial post-intervention improvement indicates that respondents acquired greater awareness of hygiene, restricted entry and other preventive measures. This result has strong support from recent evidence from Tamil Nadu. Alagesan *et al.* (2025) [4] found significant gains in farmers' knowledge of structural and operational biosecurity practices after a training programme. Their follow-up assessment also showed increased adoption of several biosecurity practices. Knowledge increased from 24.5 to 78.5 per cent, showing a gain of 54.0 percentage points. The improvement demonstrates that the intervention helped respondents recognize common poultry diseases and understand appropriate preventive or control measures. This finding is particularly relevant because a recent study among backyard poultry farmers in Kerala found that knowledge concerning chick vaccination, common poultry diseases and precautions during disease outbreaks remained inadequate among a considerable proportion of respondents. The authors emphasized the need for effective extension programmes to address these gaps. Knowledge increased from 28.5 to 74.5 per cent, producing a 46.0 percentage-point gain. Although the improvement was substantial, this practice recorded the lowest change among the ten knowledge areas. The result is important from a biosecurity perspective because improper litter and carcass disposal can contribute to disease transmission. The recent Tamil Nadu training study specifically included manure and dead-bird disposal within its biosecurity assessment and found significant knowledge improvement following training. Knowledge increased from 30.5 to 76.5 per cent, representing a 46.0 percentage-point gain. The finding indicates improved awareness regarding hygienic handling, storage and management of poultry products. This result is supported by Mahadevan *et al.* (2024), who assessed poultry workers' knowledge and biosecurity practices and highlighted the importance of awareness regarding disease prevention and biosecurity. Similar concern for hygienic poultry-product handling is reflected in the food-safety review by Thames *et al.*

(2020) [9], which emphasized hygienic measures for reducing food-borne pathogen risks in poultry meat.

The relatively lower initial knowledge may be associated with greater emphasis traditionally placed on production practices than on post-production handling. Therefore, incorporating product handling and storage into farmer training can help broaden knowledge beyond primary production. Knowledge increased from 21.0 per cent before intervention to 67.5 per cent after intervention, with a gain of 46.5 percentage points. Although post-intervention knowledge improved considerably, this remained the lowest post-knowledge level among the ten areas. The finding suggests that respondents may require additional capacity building in farm economics, marketing and systematic record keeping. Record keeping is often a less familiar component of poultry management compared with feeding, housing and vaccination. Previous research has also identified record keeping as an area with comparatively weak adoption among poultry farmers.

Overall, the results demonstrate a consistent positive change in knowledge across all ten dimensions of poultry farming. The largest gains were observed for vaccination and disease prevention (55.0 percentage points), disease identification and control (54.0 points), and scientific housing/ventilation and biosecurity (53.0 points each). These results are consistent with previous Indian studies showing that structured training and extension exposure can improve poultry farmers' knowledge. For example, Sharma *et al.* reported that after a poultry training programme in Himachal Pradesh, the proportion of trainees in the high-knowledge category increased markedly and the gain was statistically significant. The present finding is also consistent with Kumar *et al.* (2012) [8], who evaluated backyard poultry training at KVK Baghpat, Uttar Pradesh, and reported substantial knowledge gain following training, particularly in disease management and improved breeding.

Overall Adoption Index = 77.3%

Table 2 describes the extent to which 200 respondents adopted ten recommended poultry farming practices. Adoption was measured using three categories: full adoption (2), partial adoption (1) and non-adoption (0). The adoption index ranged from 63.8 to 86.5 per cent, while the overall adoption index was 77.3 per cent.

The findings indicate that the respondents generally followed the recommended practices to a considerable extent, although adoption varied according to the complexity and perceived importance of individual practices. The highest proportion of respondents, 74.0 per cent, reported full adoption of clean, dry and adequately ventilated housing, while 21.0 per cent showed partial adoption and only 5.0 per cent reported non-adoption. The resulting adoption index was 84.5 per cent. The high adoption may be attributed to the direct and visible benefits of proper housing for bird comfort, hygiene and disease prevention. Similar evidence was reported by Mandavkar *et al.* (2020) [1], where ventilation and lighting and poultry-house management were among the practices showing relatively good adoption. This overall pattern is supported by Sihag *et al.* (2021) [7], who reported predominantly medium adoption among backyard poultry beneficiaries, with housing, clean water and vaccination among the prominently adopted practices.

This practice recorded the highest adoption index of 86.5 per cent. About 77.5 per cent of respondents had fully adopted the practice, 18.0 per cent had partially adopted it and only 4.5 per cent had not adopted it. The high level of adoption may be explained by the direct relationship between feed and water management and poultry growth, health and productivity. A total of 68.5 per cent of respondents fully adopted the recommended vaccination schedule, 24.5 per cent partially adopted it and 7.0 per cent did not adopt it. The adoption index was 80.8 per cent. The relatively high adoption indicates that vaccination has become an important component of poultry health management among the respondents. However, the presence of partial and non-adopters indicates that continued extension support, reminders and veterinary guidance may still be useful.

For biosecurity, 63.0 per cent of respondents reported full adoption, while 29.0 per cent showed partial adoption and 8.0 per cent reported no adoption. The adoption index was 77.5 per cent. The relatively larger proportion of partial adopters suggests that biosecurity practices may be more difficult to implement completely than basic feeding or housing practices. This is supported by research from Uttar Pradesh, where overall biosecurity adoption among commercial farm-

ers was about 67%, with considerable gaps in specific dimensions such as restricted access. The study also found that farmer knowledge, training and other socioeconomic factors were associated with actual implementation. About 66.0 per cent of respondents fully adopted appropriate brooding temperature and chick-management practices, while 27.5 per cent partially adopted them and 6.5 per cent did not adopt them. The adoption index was 79.8 per cent.

Table 2. Adoption of Recommended Poultry Farming Practices ($n = 200$)

S. No.	Recommended practice	Full adoption (2) (%)	Partial adoption (1) (%)	Never (0) (%)	Adoption index (%)
1	Maintain clean, dry and adequately ventilated poultry housing.	148 (74.0)	42 (21.0)	10 (5.0)	84.5
2	Provide balanced feed and clean drinking water at all times.	155 (77.5)	36 (18.0)	9 (4.5)	86.5
3	Follow recommended vaccination schedule for the flock.	137 (68.5)	49 (24.5)	14 (7.0)	80.8
4	Follow biosecurity measures such as controlled entry and hygiene.	126 (63.0)	58 (29.0)	16 (8.0)	77.5
5	Maintain proper brooding temperature and chick management.	132 (66.0)	55 (27.5)	13 (6.5)	79.8
6	Monitor birds daily for signs of illness and abnormal mortality.	142 (71.0)	46 (23.0)	12 (6.0)	82.5
7	Maintain litter quality and dispose of dead birds safely.	119 (59.5)	63 (31.5)	18 (9.0)	75.3
8	Use appropriate measures to control ectoparasites, rodents and pests.	105 (52.5)	69 (34.5)	26 (13.0)	69.8
9	Handle, grade and store eggs/meat hygienically.	112 (56.0)	65 (32.5)	23 (11.5)	72.3
10	Maintain records of feed use, mortality, production, expenditure and sales.	91 (45.5)	73 (36.5)	36 (18.0)	63.8

This relatively high adoption is consistent with findings from Raigad, where brooding management was reported as an important area of adoption among poultry farmers. The practice of monitoring birds for illness and abnormal mortality had 71.0 per cent full adoption, 23.0 per cent partial adoption and 6.0 per cent non-adoption. Its adoption index was 82.5 per cent. The relatively high adoption suggests that farmers recognize the practical importance of observing birds regularly for early signs of illness. Early detection can facilitate timely intervention and potentially reduce mortality and production losses. This practice recorded 59.5 per cent full adoption, 31.5 per cent partial adoption and 9.0 per cent non-adoption, producing an adoption index of 75.3 per cent. Compared with housing, feed and water management, a larger proportion of respondents was partial adopters. This may be because safe disposal and systematic litter management require consistent attention and additional labour. Recent biosecurity research has also treated dead-bird disposal and waste management as specific components of poultry biosecurity rather than assuming that general farm hygiene automatically ensures their adoption.

Only 52.5 per cent of respondents fully adopted appropriate control measures, while 34.5 per cent were partial adopters and 13.0 per cent reported non-adoption. Consequently, the adoption index was 69.8 per cent. The comparatively lower index indicates a noticeable adoption gap. This finding is particularly important because pest and rodent control can require regular monitoring, infrastructure and repeated expenditure. Interestingly, the Tamil Nadu training intervention also found that adoption increased after training across biosecurity categories except rodent and pest control, suggesting that this particular practice can remain difficult to translate from knowledge into routine behaviour.

The practice had 56.0 per cent full adoption, 32.5 per cent partial adoption and 11.5 per cent non-adoption, with an adoption index of 72.3 per cent. The moderate adoption level suggests that respondents had incorporated hygienic product handling to some extent, but com-

plete implementation was not universal. This area may benefit from practical demonstrations emphasizing cleanliness, grading, storage conditions and prevention of contamination. Record keeping showed the lowest adoption index (63.8%). Only 45.5 per cent of respondents fully adopted the practice, while 36.5 per cent were partial adopters and 18.0 per cent did not adopt it. This indicates that record keeping was the weakest component of recommended poultry management among the respondents. The overall adoption index of 77.3 per cent indicates that the respondents had incorporated a substantial proportion of the recommended poultry farming practices. The strongest adoption was observed for balanced feeding and clean drinking water (86.5%), followed by clean and ventilated housing (84.5%) and daily monitoring of birds (82.5%). In contrast, comparatively lower adoption was observed for record keeping (63.8%), control of ectoparasites, rodents and pests (69.8%), and hygienic handling/storage of poultry products (72.3%). The need for continued attention to hygienic handling is consistent with [Thames et al. \(2020\) \[9\]](#), who emphasized food-safety measures and hygienic handling to reduce contamination risks in poultry products. The relatively weaker adoption of management-oriented practices is consistent with [Goswami and Biswas \(2020\)](#), who reported differences in knowledge-based adoption behaviour among poultry farmers, indicating that knowledge does not necessarily translate uniformly into practice.

The pattern suggests that practices that are directly connected with day-to-day bird care and have easily observable benefits were more commonly adopted, whereas practices requiring systematic documentation, repeated monitoring or additional resources showed relatively lower adoption. This interpretation is also broadly consistent with previous studies showing that training and extension exposure are associated with improved adoption of scientific poultry practices. [Jat et al. \(2012\) \[3\]](#) reported greater adoption among registered poultry farmers compared with unregistered farmers and related this pattern to training and exposure.

Conclusion

The study shows a clear improvement in poultry-related knowledge among the 200 rural youth trained under the ARYA programme. Across all ten knowledge areas, post-training knowledge was substantially higher than pre-training knowledge, with gains ranging from 46.0 to 55.0 percentage points. The highest gain was observed for vaccination and disease prevention, followed by disease identification and control, scientific housing and biosecurity. Adoption of recommended poultry practices was also considerable, as reflected by the overall adoption index of 77.3 per cent. Feeding and water management, housing, and daily health monitoring showed comparatively higher adoption, whereas record keeping, pest and rodent control, and hygienic product handling showed comparatively lower adoption. Taken together, the findings indicate that structured training is an important component of poultry enterprise development among rural youth. At the same time, improved knowledge does not automatically result in complete adoption of every practice. Continued mentoring, hands-on demonstrations, monitoring and enterprise-management support are therefore important, particularly for practices requiring regular documentation, investment, repeated monitoring and strict biosecurity. KVKs can play an important role in sustaining these improvements through follow-up technical guidance under ARYA.

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