



Effectiveness of Trainings on Knowledge Gain about Milk Processing

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ABSTRACT

In order to evaluate effectiveness of scientific trainings on knowledge gain about milk processing, 60 farmers from on campus trainings were selected. Majority of trainees (46.67 %) were less than 30 years of age and 65 per cent trainees had annual income between 1-6 lakh. Significant increase in the proportion of correct responses given for different knowledge statements was observed. There was significant ($P < .01$) increase in knowledge index from 11.93 ± 1.54 before training to 54.53 ± 1.37 after training with a knowledge gain of 42.60 ± 1.42 . Further, it was clearly seen that training interaction with mass media exposure and extension agency contact had significant impact on the scores obtained before and after training.

Key Words: Food, Knowledge, Milk, Processing, Technique, Training.

INTRODUCTION

Milk is highly a perishable food because it is an easy medium for the growth of bacterial pathogens and other microorganisms which can lead to milk spoilage and result in diseased condition for the consumers. Milk processing allows the preservation of milk for days, weeks or months and largely helps to reduce food-borne illness. The shelf life of milk can be extended for several days through techniques such as cooling (essential to ensure raw milk quality), fermentation, pasteurization etc. Pasteurization is a heat treatment process that extends the keeping quality of milk and reduces the numbers of possible pathogenic microorganisms to levels at which they do not represent a significant health hazard. Milk can be processed further to convert it into high-value, concentrated and easily transportable dairy products with long shelf-lives such as butter, cheese and ghee. Processing of dairy products gives small-scale dairy producers higher cash incomes than selling raw milk and offers better opportunities to reach regional and urban markets.

Milk processing can also help to deal with seasonal fluctuations in milk supply. The transformation of raw milk into processed milk and products can benefit entire communities by

generating off-farm jobs in milk collection, transportation, processing and marketing. Providing a big push to the country's dairy industry, the Finance Minister announced in Union Budget 2020, that the government aims to take India's milk processing capacity to double the current levels. While the country processes 53.5 Mt currently, the same will be scaled up to 108 Mt by 2025. The milk production has increased from 176.3 Mt in 2017-18 to 187.7 Mt in 2018-19 registering a growth of 6.5 %. Also the per capita availability of milk increased from 233 g/day in 2004-05 to 394 g/day in 2018-19 (BAHS 2019). The annual increase in milk production will increase to 9 per cent by 2022 from current 6.3 per cent on the back of several government initiatives (Economic Times, 2018). Surplus raw livestock products can be processed and marketed to prevent wastage, maximize profit in addition to providing nutritional security. Processing diversifies product development which helps in increasing consumer appeal and also increases storage time so that these might be used when needed.

In order to encourage milk processing, training programmes specially designed for this purpose are a necessity. Training is a prerequisite for any worthwhile action and it can help counter limitations like low awareness of improved

technologies/ practices and poor knowledge level regarding the enterprise, by imparting know how directly. Hundal *et al* (2016) analysed the role of training in changing knowledge level of dairy farmers and revealed that 69.6 %, 26.0 % and 4.4 % farmers belonged to low, moderate and high level knowledge category before training, respectively. However, 81.9 % ($P < 0.01$) farmers possessed high level knowledge after training. Shelly and Sharma (2022) have highlighted the importance of training in technology adoption by farmers. This study was designed to find the effectiveness of meat processing trainings conducted by Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana in terms of knowledge gain of the trainees.

MATERIALS AND METHODS

About 60 trainees from various milk processing trainings conducted by Guru Angad Dev Veterinary and Animal Sciences University from August 2021 to August 2022 were selected. Questionnaire on knowledge test was prepared and pretested. Knowledge test included 25 multiple choice questions. All the 25 questions had total four options with single correct option. These questions about knowledge test were collected from the various lectures conducted by subject matter specialists and scheduled regularly during the training programmes.

Questions were included on a wide variety of areas like pasteurization types, vacuum packaging, forms of khoa, mozzarella cheese, milk adulteration testing kit, fat and SNF percent in various milk types etc. For knowledge evaluation through test, each correct answer was scored as one and each wrong answer was scored zero. The sum of score was taken as knowledge score. For each training programme, maximum possible score was 25 and minimum was 0. Knowledge Index (KI) at pre and post evaluation stage was calculated by dividing the total score obtained by the maximum obtainable score and multiplying the result with 100. Data were analyzed using SAS 9.3.

$$KI = \frac{\text{Obtained score}}{\text{Maximum possible score}} \times 100$$

$$\text{Knowledge gain} = KI (\text{pre test}) - KI (\text{post test})$$

RESULTS AND DISCUSSION

Socio-personal and communication profile of Milk processing trainees:-

Out of the 60 respondents from milk processing (Table 1), 46.67 % were less than 30 years of age. Majority (43.33 %) were graduates and above. It was seen that many educated urban residents attended the training in the hope of learning best methods of preparing unique milk products. Most respondents (65 %) had annual income between 1-6 lakh. At least 43.33 percent had both land and animal as source of income and 30.0 % had business/service as occupation. Majority (45 %) had land holding between 0.4-2 ha. Forty five percent had low level of mass media exposure (Table 1) and an equal number had medium level of exposure. Majority (70 %) had medium level of extension agency contact. However, 60 percent respondents had low level of social participation.

Impact of Milk processing training on knowledge level of trainees

The data (Table 2) list the pre-training and post training scores of respondents after week long training programme. Only 10 % knew about high temperature short time pasteurization before training but after training 80 % were aware of the same.

Similarly knowledge regarding fat percent in different milk types (23.33 % before vs 95 % after), whey drink preparation (11.67% before vs 51.67% after), reason for *khoa* becoming hard (23.33% before vs 86.67% after), scrapped surface heat exchanger (18.33% vs 61.67%), fermented dairy products (31.67% vs 90 %) and basis for determining cost of cow milk (53.33% vs 91.67%) increased profoundly and significantly ($P < 0.01$). Therefore, training is very helpful in equipping the trainees with correct knowledge for requirement of enterprise.

Evaluation of Pre-training KI, Post-training KI, Knowledge gain in Milk processing w.r.t. independent variables

The overall pre KI of 11.93 ± 1.54 increased to post KI of 54.53 ± 1.37 with a knowledge gain of 42.60 ± 1.42 which was significant ($P < 0.0001$). Age doesn't have much

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Table 1. Socio-personal and communication profile of trainees.

Attribute	Parameter	Frequency (percentage)
Age (years)	≤ 30 years	28 (46.67)
	31-45 years	23 (38.33)
	≥ 46 years	9 (15.00)
Education	High school	13 (21.67)
	10+2	21 (35.00)
	Graduate and above	26 (43.33)
Income /year	< 1 lakh	15 (25.00)
	1-6 lakh	39 (65.00)
	≥ 6 lakh	6 (10.00)
Income source	Only land	7 (11.67)
	Only animals	4 (6.67)
	Land and animals	26 (43.33)
	Land and others (service/business)	5 (8.33)
	Others	18 (30.00)
	All three (land, animals, others)	-
Land (ha)	Landless	16 (26.67)
	0.4-2.0	27 (45.00)
	2.0-4.0	9 (15.00)
	>4.0	8 (13.33)
Mass media exposure	Low	27 (45.00)
	Medium	27 (45.00)
	High	6 (10.00)
Extension agency contact	Low	12 (20.00)
	Medium	42 (70.00)
	High	6 (10.00)
Social participation	Low	36 (60.00)
	Medium	24 (40.00)
	High	-

effect except for post KI which was lowest (49.78 ± 2.84) in ≥ 46 years category. Pre KI and post KI were lowest (6.15 ± 1.73 and 46.77 ± 1.66 respectively) in 'high school' education category. Further, pre KI and post KI were highest (28.67 ± 6.96 and 67.33 ± 7.19 respectively) in ' ≥ 6 lakh' annual income category but knowledge gain was not statistically significant ($P < .05$) between categories. As far as income source is concerned, pre KI is lowest (3.43 ± 2.38) in 'only land'

category and knowledge gain is highest (50.86 ± 4.59) in this category. Again pre KI was highest (20.0 ± 5.42) in '5-10 acres' land holding category but knowledge gain was lowest (34.67 ± 5.12) in this category.

CONCLUSION

The study demonstrated significant increase ($P < .01$) in the Knowledge Index of trainees after training. The awareness level regarding various

Table 2. Impact of milk processing training on knowledge level of trainees.

Q. No.	Statement	Correct responses (%)			
		Pre-training	Post-training	Chi square value	P value
1	Fermented dairy products	19 (31.67)	54 (90.00)	42.845	<.0001
2	Cheese for pizza manufacture	6 (10.00)	59 (98.33)	94.288	<.0001
3	SNF includes ?	26 (43.33)	56 (93.33)	34.659	<.0001
4	Cost of cow milk based on ?	32 (53.33)	55 (91.67)	22.111	<.0001
5	FSSAI, 2011 standards for fat and SNF	4 (6.67)	17 (28.33)	9.755	0.002
6	Scrapped surface heat exchanger	11 (18.33)	37 (61.67)	23.472	<.0001
7	Three forms of khoa	7 (11.67)	20 (33.33)	8.076	0.004
8	Difference in three khoa forms	0	12 (20.00)	13.333	0.0003
9	Product to save khoa from fungus	0	15 (25.00)	17.143	<.0001
10	Reason for khoa becoming hard	14 (23.33)	52 (86.67)	48.619	<.0001
11	Tin packaging for khoa	5 (8.33)	46 (76.67)	57.323	<.0001
12	Technique to make milk germ free	2 (3.33)	11 (18.33)	6.988	0.008
13	Adulteration testing kit	2 (3.33)	12 (20.00)	8.086	0.004
14	Vacuum packing	0	16 (26.67)	18.462	<.0001
15	LTLT pasteurization	0	15 (25.00)	17.143	<.0001
16	HTST pasteurization	6 (10.00)	48 (80.00)	59.394	<.0001
17	Protein percent in mozzarella cheese	1 (1.67)	38 (63.33)	52.004	<.0001
18	Small air bubbles on mozzarella cheese	0	12 (20.00)	13.333	0.0003
19	Mozarella cheese pH	0	6 (10.00)	6.316	0.012
20	Whey drink preparation	7 (11.67)	31 (51.67)	22.182	<.0001
21	Fat percent in buffalo milk	0	29 (48.33)	38.242	<.0001
22	Easy digestibility of goat milk	10 (16.67)	54 (90.00)	64.821	<.0001
23	Milk types based on fat percent	14 (23.33)	57 (95.00)	63.777	<.0001
24	Fat and SNF in green packed milk	0	17 (28.33)	19.806	<.0001
25	Material to prepare curd cups	13 (21.67)	46 (76.67)	36.310	<.0001

aspects of milk processing also increased many fold. Therefore scientific trainings on milk processing are a must to gather information for efficient milk processing in order to prevent wastage and ensure quality products.

REFERENCES

- BAHS (Basic Animal Husbandry and Statistics). 2019. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, New Delhi.
- Anonymous (2018). Economic Times . <https://m.economictimes.com/news/economy/agriculture/milk-production-to-grow-at-9-per-cent-annually-by-2022-from-6-per-cent-now-radha-mohan-singh/articleshow/64418219.cms>
- Hundal J S, Chahal U S, Kansal S K and Bhatti J S (2016a). Role of training in changing knowledge level among dairy farmers of Punjab. *Haryana Vet* **55** (2): 220-23.

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Table 3. Pre-training KI, Post-training KI, Knowledge gain and Adoption score percent of milk processing training w.r.t. independent variables.

Parameter	Pre KI (Mean $\pm$ SE)	Post KI (Mean $\pm$ SE)	Knowledge gain (Mean $\pm$ SE)	Adoption score percent (Mean $\pm$ SE)
Age				
< 30 years	11.28 ^a $\pm$ 2.22	55.71 ^a $\pm$ 1.99	44.43 ^a $\pm$ 2.38	4.36 ^b $\pm$ 2.31
31-45 years	13.22 ^a $\pm$ 2.63	54.96 ^a $\pm$ 2.38	41.74 ^a $\pm$ 2.06	20.77 ^a $\pm$ 5.42
$\geq$ 46 years	10.67 ^a $\pm$ 3.89	49.78 ^b $\pm$ 2.84	39.11 ^a $\pm$ 2.56	32.09 ^a $\pm$ 9.88
Education				
High school	6.15 ^b $\pm$ 1.73	46.77 ^c $\pm$ 1.66	40.62 ^b $\pm$ 1.56	22.22 ^a $\pm$ 7.55
10+2	12.95 ^a $\pm$ 1.72	52.76 ^b $\pm$ 1.92	39.81 ^b $\pm$ 1.92	17.99 ^{ab} $\pm$ 5.96
Graduate and above	14.00 ^a $\pm$ 3.06	59.85 ^a $\pm$ 2.19	45.85 ^a $\pm$ 2.69	8.55 ^b $\pm$ 3.22
Income/year				
< 1 lakh	10.93 ^b $\pm$ 1.32	55.73 ^b $\pm$ 2.32	44.80 ^a $\pm$ 2.87	19.26 ^a $\pm$ 5.89
1-6 lakh	9.74 ^b $\pm$ 1.77	52.10 ^b $\pm$ 1.37	42.36 ^a $\pm$ 1.82	12.54 ^a $\pm$ 3.79
$\geq$ 6 lakh	28.67 ^a $\pm$ 6.96	67.33 ^a $\pm$ 7.19	38.67 ^a $\pm$ 3.21	18.52 ^a $\pm$ 10.61
Income source				
Only land	3.43 ^b $\pm$ 2.38	54.28 ^a $\pm$ 5.15	50.86 ^a $\pm$ 4.59	7.94 ^a $\pm$ 7.94
Only animals	13.00 ^a $\pm$ 4.12	52.00 ^a $\pm$ 4.62	39.00 ^{bc} $\pm$ 5.74	13.89 ^a $\pm$ 13.89
Land and animals	14.62 ^a $\pm$ 2.17	55.08 ^a $\pm$ 1.49	40.46 ^{bc} $\pm$ 2.22	17.52 ^a $\pm$ 4.45
Land and others (service/business)	14.40 ^a $\pm$ 3.92	49.60 ^a $\pm$ 3.92	35.20 ^c $\pm$ 2.65	26.67 ^a $\pm$ 12.47
Others	10.44 ^a $\pm$ 3.51	55.78 ^a $\pm$ 3.32	45.33 ^{ab} $\pm$ 2.17	10.49 ^a $\pm$ 5.71
All three (land, animals, others)	-	-	-	-
Land (ha)				
Landless	12.75 ^b $\pm$ 3.71	60.50 ^a $\pm$ 3.20	47.75 ^a $\pm$ 2.69	0 ^b
0.4-2.0	9.78 ^b $\pm$ 1.44	52.30 ^b $\pm$ 1.68	42.52 ^a $\pm$ 1.74	31.28 ^a $\pm$ 5.10
2.0-4.0	20.00 ^a $\pm$ 5.42	54.67 ^b $\pm$ 3.26	34.67 ^b $\pm$ 5.12	0 ^b
>4.0	8.50 ^b $\pm$ 3.50	50.00 ^b $\pm$ 3.30	41.50 ^a $\pm$ 2.61	5.55 ^b $\pm$ 3.64
Overall	11.93 $\pm$ 1.54	54.53 $\pm$ 1.37	42.60 $\pm$ 1.42	14.81 $\pm$ 3.03

Figures with different superscripts in a column for different variables differ significantly ($P < .05$)

Shelly M and Sharma M (2022) Effectiveness of training on adoption behavior of pig farmers. *J Krishi Vigyan*, 11(SI):14-19. Received on 11/7/2024 Accepted on 5/9/2024