

Original Research Article

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Awareness of Aflatoxin Contamination in Feed by Dairy Farmers of Punjab

Insha Mir, Parminder Singh, J. S. Bedi, S. K. Kansal and H. K. Verma

Department of Veterinary & Animal Husbandry Extension Education
Guru AngadDev Veterinary & Animal Sciences University, Ludhiana, India

**Corresponding author*

ABSTRACT

250 dairy farmers were randomly contacted in Punjab during regional kisan melas conducted by the university. They were subjected to interview schedule to study their knowledge and practices being adopted to control aflatoxin in the dairy rations. Majority of the dairy farmers(56%)belonged to middle age group. (25.6%)of the dairy farmers had high school of education and (39.2%) had experience of more than 10 years in dairy farming. Only (37.2%) dairy farmers had any formal training. (53.20%) dairy farmers had medium herd strength and mostly comprised of buffaloes (66.0%).Majority (53.6%) of dairy farmers used mobile as a source of information and only 8.8% still relied on radio. Overall dairy farmers (80.8%) had medium exposure of mass media. (58.0%) dairy farmers did not hear about of aflatoxin contamination in feed. Only (22.4%) and (16.0%) dairy farmers knew that aflatoxin can be transferred to animals and milk respectively. Majority (44.0%) of dairy farmers stored feed for a month and hardly 21.2 percent farmers knew about toxin binders. So, this study focused on need of educating the dairy farmers through extensive awareness campaigns about harmful effects of aflatoxin in animals feed.

Keywords

Aflatoxin
Contamination,
Dairy farmers

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Introduction

250 dairy farmers were randomly contacted in Punjab during regional kisan melas conducted by the university. They were subjected to interview schedule to study their knowledge and practices being adopted to control aflatoxin in the dairy rations. Majority of the dairy farmers(56%)belonged to middle age group. (25.6%)of the dairy farmers had high school of education and (39.2%) had experience of more than 10 years in dairy

farming. Only (37.2%) dairy farmers had any formal training. (53.20%) dairy farmers had medium herd strength and mostly comprised of buffaloes (66.0%).Majority (53.6%) of dairy farmers used mobile as a source of information and only 8.8% still relied on radio. Overall dairy farmers (80.8%) had medium exposure of mass media. (58.0%) dairy farmers did not hear about of aflatoxin contamination in feed. Only (22.4%) and (16.0%) dairy farmers knew that aflatoxin can be transferred to animals and milk

respectively. Majority (44.0%) of dairy farmers stored feed for a month and hardly 21.2 percent farmers knew about toxin binders. So, this study focused on need of educating the dairy farmers through extensive awareness campaigns about harmful effects of aflatoxin in animals feed.

Materials and Methods

The present study was conducted in Punjab. 250 dairy farmers which were randomly selected who visited kisan melas, attended seminars and took dairy trainings conducted by the university. Structured questionnaire was designed which was pre tested before conducting the survey. Face to face interviews were conducted in vernacular language (Punjabi), Hindi, or combination of both languages. The data was tabulated and analyzed using statistical package for the Social Science (SPSS) version 20 developed by IBM Company, USA.

Results and Discussion

The socio personal profile of dairy farmers is given in Table 1. (56.00%) of the respondents belonged to middle age group followed by young (25.60%) and old age (18.40%) group. Regarding education level, most of the respondents studied up to high school (25.60%) followed by higher secondary (24.40%), Middle (21.60%), Primary (17.60%) and Graduate & above (10.80%). Majority of the dairy farmers (62.40%) had medium size family which was followed by small (19.60%) and large family (18.00%). It was revealed that majority (64.80%) of the respondent's belonged to joint families. 39.20% of the respondent's possessed good experience of more than 10 years in dairy farming followed by (34.40%) having 5-10 years of experience. It was evident that majority (62.8%) did not attend any training. The same findings were in agreement with

Kasrija (2016) who studied that majority of dairy farmers had not received any kind of training regarding dairy farming and were not aware regarding the curriculum of training programmes.

It was found that (53.20%) dairy farmers who were interviewed possessed medium herd size (Table 2), followed by (27.6%) small size herd and (19.20%) large herd size. Most of the dairy farmers had medium and small size dairy units because of scarcity of green fodder, non-availability of grazing lands, high cost of milk production and high cost of high labour. Regarding herd composition, it was found that majority (66%) reared buffalo and (25.20%) possessed cross bred cattle and only (8.8%) reared indigenous breeds. This revealed that rearing of buffaloes by dairy farmers was practiced more in Punjab. (39.60%) belonged to low category followed by medium (37.60%) and high milk production group (22.80%). Similar findings were reported by Laldinpuii (2013) who studied that majority of the respondents belonged to low milk production followed by medium milk production. The low milk production of majority of dairy farmers was due to low herd strength and also may be through breeding and feeding ignorance.

The results of the study revealed that majority of the dairy farmers (58%) haven't heard the term aflatoxin (Table 3), similar studies by Marechera and Ndwiga (2014) reported that respondents had a lower knowledge with regard to aflatoxin. Awareness of aflatoxin contamination in crops in the field and during storage was reported by only (28%) of the respondents. Majority (77.60%) of the respondents reported that aflatoxin will not get transferred to animals by eating feed infested with aflatoxin. Regarding aflatoxin contamination in milk, only (16%) of the respondents were aware that aflatoxin can be transferred to milk. Majority (78%) of the

respondents were unaware of harmful effects of aflatoxin on humans due to consumption of milk containing aflatoxin. Same validation of perception was reported by Shephard (2008) that in developing country people are less aware about aflatoxicosis in humans due to environmental conditions that promote fungal growth in feed and transfer to milk by feeding contaminated feed to the animals.

It is evident from the Table 4, that the cause of aflatoxin was known only to (25.20%) respondents. Majority (76.40%) of the respondents were unaware that delayed harvesting can cause aflatoxin in the crops while (23.60%) of the respondents agreed that due to delayed harvesting, their crops were infested with fungi. Delayed drying as the cause of aflatoxin was reported by only (33.20%). Also the cause of aflatoxin due to high rain during harvesting reported by (20%) of the respondents and by poor storage conditioned (28.40%) which revealed that proper storage will enhance the quality of feed and fodder. The study is in agreement with Kimanya *et al* (2010) who found that majority of livestock farmers were not aware that due to improper drying, delayed drying and storage in poor ventilated rooms prompt to aflatoxin contamination.

Table 5 further revealed that only (22%) of the respondents were aware about the crops infested with aflatoxin had different taste, also (28%) of the respondents knew that infested crops differ in colour resulting in subsequent feed discoloration, off smell and off taste. Similar finding was also reported by Golob (2007) that moulds infestation affect the taste, appearance of feed on which they are growing which may help farmers in deciding to discard the feeds. Only (4.40%) of the respondents were aware regarding aflatoxin in feed causes stunning in animals. Similar study were also reported by Khayoon *et al* (2012) that majority of the respondents were not having

knowledge regarding the risk of aflatoxin to animals and also feedstuff which had been contaminated that might cause suppression of immune system, stunning growth and mutagenic effect. It was also observed that only (35.60%) farmers knew that aflatoxin reduces animal productivity. This is in apparent with study of Grace *et al* (2015) who reported that less population perceived that fungal toxin contamination of feeds impair health leading to low productivity in animals.

Respondents were asked a series of questions related to aflatoxin which pertain to dryness of feed, storage duration, conditions of storage, testing of aflatoxin and its harmful effects as depicted in Table 6. (35.60%) of the dairy farmers agreed that animal feed should be well dried before storage and (42%) agreed that animal feed should be stored in a well-ventilated, clean & dry place. Monda *et al* (2016) reported that moisture content of grain and poor storage conditions will promote aflatoxin contamination in feedstuffs. Testing of milk is essential to detect aflatoxin contamination in milk and it was observed that (30.80%) of the dairy farmers wanted that testing should be done with regard to aflatoxin in milk. Lindahl (2018) reported that milk consumption is important for the population; there should be standards for testing the aflatoxin in milk.

It was found that (42.80%) of the respondents believed that testing of branded feed for aflatoxin should be done before sale (Table 6). Readymade feeds could be another potential source of aflatoxin for dairy animals as aflatoxin may be present in readymade feed due to high molasses content, high moisture content, long storage of feed which increase the level of aflatoxin in feed stuff during storage caused by growth of fungi in feeds due to optimal humid climate and temperature (Creppy 2002). It was further observed that (35.60%) of the respondents who knew

aflatoxin infestation, believed that aflatoxin can be transferred to milk. Galvano *et al* (2005) also reported that ingestion of AFB1 is transferred as AFM1 in milk and the concentration of aflatoxin in milk is proportional to concentration in feed.

It was concluded from Fig 1, majority (62.60%) of the dairy farmers had low knowledge level regarding aflatoxin

contamination in feed, fodder and milk. The dairy farmers with low education level, less experienced and who lack the mass media exposure generally was ignorant about aflatoxin awareness. There is a need to educate dairy farmers through extensive awareness campaigns about sources of aflatoxin in animal feedstuff and farm management practices to reduce their impact.

Table.1 Categorization of Respondents according to Socio Personal profile

Particulars	Categories	Frequency	Percentage
Age	Young (up to 35 years)	64	25.60
	Middle (30-50 years)	140	56.00
	Old (Above 50 years)	46	18.40
Education	Primary	44	17.60
	Middle	54	21.60
	High school	64	25.60
	Higher secondary	61	24.40
	Graduate & above	27	10.80
Family size	Small (Up to 4 members)	49	19.60
	Medium (5-8 members)	156	62.40
	Large (>8 members)	45	18.00
Type of family	Nuclear	88	35.20
	Joint	162	64.80
Experience in dairy farming	1-5 years	66	26.40
	5-10 years	86	34.40
	More than 10 years	98	39.20
Training	Attended	93	37.20
	Not attended	157	62.80

Table.2 Distribution of respondents according to herd size and composition

Particulars	Categories	Frequency	Percentage
Herd size	Small \geq 5 animals	69	27.60
	Medium(6-15 animals)	133	53.20
	Large(16 animals & above)	48	19.20
Herd composition	Indigenous	22	8.80
	Cross bred	63	25.20
	Buffalo	165	66.00
Total milk production per day (in litres)	Low (<20)	99	39.60
	Medium (20-40)	94	37.60
	High (>40)	57	22.80

Table.3 Categorization of Respondents according to knowledge regarding occurrence of aflatoxin

Particulars	Yes	No
Heard about aflatoxin	105 (42.00)	145 (58.00)
Aware of aflatoxin contamination in crops in the field and during storage	70 (28.00)	180 (72.00)
Aflatoxin can be transferred to animals via by contaminated feed	56 (22.40)	194 (77.60)
Aflatoxin can be transferred into milk via by contaminated feed	40 (16.00)	210 (84.00)
Aware of harmful effects of aflatoxin on humans due to consumption of milk containing aflatoxin	55 (22.00)	195 (78.00)

Table.4 Categorization of Respondents according to knowledge regarding cause of aflatoxin

Particulars	Yes	No
Caused by fungi	63 (25.20)	187 (74.80)
Delayed harvesting	59 (23.60)	191 (76.40)
Delayed drying	83 (33.20)	167 (66.80)
Rain causes fungal growth during harvesting	50 (20.00)	200 (80.00)
Poor storage conditions	71 (28.40)	179 (71.60)

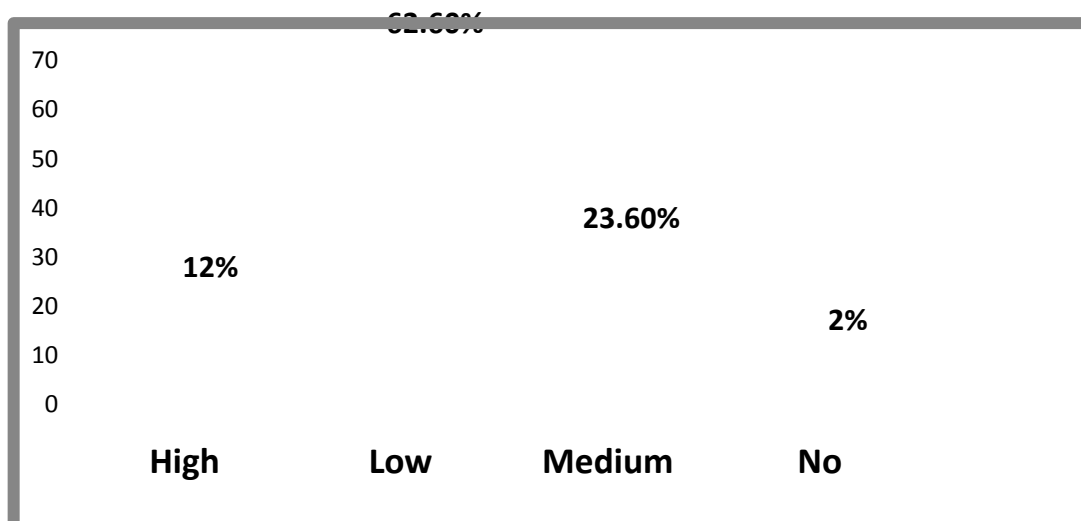
Table.5 Categorization of Respondents according to knowledge regarding effect of aflatoxin contamination

Particulars	Yes	No
Fungi produce toxic substances	59 (23.60)	191 (76.40)
Crops differ in taste produce aflatoxin	55 (22.00)	195 (78.00)
Crops differ in colour promote aflatoxin	70 (28.00)	180 (72.00)
Aflatoxin cause stunning in animals	11 (4.40)	219 (87.60)
Aflatoxin contamination reduces animal productivity	89 (35.60)	161 (64.40)

Table.6 Categorization of Respondents according to attitude regarding aflatoxincontamination in animal feed, fodder and milk (n=250)

Particulars	Agreed
Do you think that animal feed should be well dried before storage	89 (35.60)
Do you know that animal feed should be stored in a well-ventilated, clean & dry place	105 (42.00)
Do you believe testing of readymade feed for aflatoxin should be done before sale	107 (42.80)
Do you think that aflatoxin can be transferred to milk via by aflatoxin contaminated feed?	89 (35.60)

Fig.1 Knowledge score of respondents regarding aflatoxin contamination in animal feed



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