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Aflatoxins in milk: An overview on control strategies

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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. 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 longer time and found their prone to fungal infestation in feed. About, 21.2 percent farmers knew about toxin binders.

Keywords: Aflatoxins, milk, control strategies and toxin binder

Introduction
Aflatoxins contamination is reported in variety of animal feed stuffs such as oilseeds, cereals and nuts which are commonly used by dairy farmers to feed their animals (Lunyasunya *et al.* 2005) [4]. Aflatoxins commonly contaminate the crops in the field prior to harvest, postharvest contamination can occur if a crop drying is delayed and during storage of the crop (Martins *et al.* 2007) [5]. Contamination of animal feed commodities was reported from hot and humid regions worldwide (Murphy *et al.* 2006) [6]. In the recent years, globally an increasing consumption of milk has been observed due to its high nutritional role in human health and humans exposure to high level of aflatoxins due to consumption of contaminated feeds and foods has been shown to cause acute aflatoxicosis which manifest as hepatotoxicity. The European Commission (EC) has established a maximum permissible limit (MPL) of 0.05 ug/l or ppb for AFM1 in milk, whereas FDA and Food Safety and Standard Authority of India (FSSAI) have established the MPL at 0.5 ug/l (FDA 1997) [2], however no legal limits for establishment for dairy animals feeds and fodder in India.
Current analytical techniques mainly include fast screening methods and confirmatory quantification. Competitive ELISA (Enzyme linked immuno- sorbant assay) is a preferred choice for screening aflatoxins in various fed matrices as it is simple, sensitive and cost effective. Unseasonal rains and related flash floods are very common in India, and this enhances the moisture content of the grains and therefore its vulnerability to fungal attack.
Aflatoxin level in feed can be reduced by adopting an integrated mycotoxin management system incorporating the use of mould inhibitors and toxin binders in feed production (Bindhu and Jin 2015) [1]. Since cattle feed is the main concern of preventing level of aflatoxins, it was observed that only 14 per cent cattle feed millers in Punjab were using toxin binders and less than 5 per cent were using mould inhibitors in their branded cattle feed (Singh *et al.* 2012) [9].

Materials and Methods
The present study was conducted in Punjab. 250 dairy farmers which were randomly selected who visited kisanmelas, 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.

Results and Discussion
Effect of aflatoxin contamination
The results revealed that only (23.60%) of the respondents were aware that fungi produce toxic substances, it was found that majority (76.40%) of dairy farmers had difficulty in knowing what aflatoxin is all about.

In a similar study by Jelliffe *et al.* (2016) [3] who reported that majority of the respondents were unaware and only 6% managed to come out that feed infested with fungi may contain inherent toxins on spoilage. This implies that respondents had limited knowledge about the cause of aflatoxin.

Further revealed that only (22%) of the respondents were aware that crops differ in taste produce aflatoxins and also (28%) of the respondents were aware that crops differ in colour promote aflatoxins as feed discoloration , off smell and off taste are useful fronline indicative factors to suspect feed contamination and presence of aflatoxin and putting consumers to higher risk.

Attitude of dairy farmers related to aflatoxins

Respondents were asked a series of questions related to aflatoxins pertaining to dryness of feed, storage duration, conditions of storage, testing of aflatoxin and its harmful effects. Testing of milk is essential to detect aflatoxin contamination in milk and it was found (30.80%) of the dairy farmers believed that testing should be done with regard to aflatoxin in milk. Lindahl (2019) [7] reported that milk consumption is important for the population, there should be standards for testing the aflatoxins in milk.

It was further observed that (35.60%) of the respondents believed that aflatoxin can be transferred to milk via aflatoxin. The ingestion of AFB1 is transferred as AFM1 in milk and the results presented that concentration of aflatoxin in feed is inversely proportional to concentration in milk.

Detoxification of feed

Mycotoxin binders or adsorbing agents help in reduction of aflatoxin bioavailability. The treatment of contaminated feeds with mycotoxins binding agents may be useful to protect animal health and avoid milk contamination by the carcinogenic AFM1 metabolite. The same was asked from respondents presented in table 32, and results obtained that only (21.20%) used to detoxify their feed with toxin binders. Obura *et al.* (2017) [8] reported in Kenya that use of clays help in reducing human exposure to aflatoxins. Besides the use of mycotoxins binders in feeds to reduce uptake by animals, dilution of contaminated feeding stuff.

Further it was observed that (19.60%) of the respondents found improvement after using toxin binder in animals. In accordance with Mutua *et al.* (2019) [7] reported that use of mycotoxin binders alone cannot solve the problem of aflatoxin contamination, it needs good production handling, manufacturing practices, which are the primary mycotoxin control strategies standards.

Criteria for selection a particular brand of toxin binder

The best approach for reducing aflatoxin in animal feeds is prevention of mycotoxin formation by using toxin binders. Mycotoxin binders are popular because of their low cost, ease of use and effectiveness in small quantities. From study, it has been found that majority of the respondents used toxin binders recommended by dairy consultants which was ranked as one followed by gift from companies, according to rate, research at own farm, frequent visit by sales man, availability at feed mill and last ranked was information given by other farmers.

References

1. Bindhu LK, Jin KT. Mycotoxin binders- evaluation of efficiency by the in vitro method. International Poultry Production. 2015;18(1):13-15.
2. FDA (Food and Drug Administration). Adulterated Food. Federal Food Drug and Cosmetic Act, Chapter IV: Definitions and Standards for Food, Sec. 1997;402(a):1.
3. Jelliffe J, Bravo-Ureta BE, Deom CM, Okello DK. University of Connecticut, Department of Agricultural and Resource Economics, Charles J. Zwick Center for Food and Resource Policy; c2016.
4. Lunyasunya TP, Wamae LW, Musa HH, Olowofesso O, Lokwaleput IK. The risks of mycotoxins contamination of dairy feed and milk on smallholder dairy farms in Kenya. Pakistan Journal of Nutrition. 2005;4:162-69.
5. Martins HM, Mendes Guerra MM, D'alemeida Bernardo FM. Occurrence of aflatoxins B1 in dairy cow feed over 10 years in Portugal (1995-2004). Revista Ibero Americana de Micologia. 2007;24:69-70.
6. Murphy PA, Hendrich S, Landgren C, Bryant CM. Food mycotoxins. Journal of Food Science. 2006;71:51-65.
7. Mutua F, Lindahl J, Grace D. Availability and use of mycotoxin binders in selected urban and Peri-urban areas of Kenya. Food Security. 2019;11:359-369.
8. Obura AA, Montgomery J, Yard, Martin E, Daniel C, Zitomer J, *et al.* Evaluation of efficacy, acceptability and palatability of calcium mont morillonite clay used to reduce aflatoxin B1 dietary exposure in a crossover study in Kenya. Food additives and contaminants. 2017;34:93-102.
9. Singh P, Singh J, Verma HK. Proficiency of cattle feed millers of Punjab. International conference on Sustainable Agriculture for Food - Livelihood security, Ludhiana. India. Crop improvement. 2012;39:1505-06.