

OCCURRENCE OF THIRAM ECTOPARASITICIDE IN ANIMAL FEED STUFF(S)

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ABSTRACT

Thiram (tetramethylthiuram disulphide) is a common ectoparasiticide, used post harvest in cereal, cotton and soybean seeds to protect them from fungal attack and retain germination potential. The seeds treated with thiram sporadically gain entry into animal feed manufacturing and its toxicity is observed in poultry and animals. The occurrence of thiram in various feed ingredients and in feeds was investigated. A total of 636 samples of feed ingredients and feeds were analysed for thiram qualitatively. Among the cereals analysed jowar showed presence of thiram in 5 out of 95 samples analysed followed by bajra in 3 out of 256 samples. While only one maize sample was found to be contaminated with thiram out of 213 samples, the rest of the ingredients were found to be negative for thiram traces. The presence of thiram, though in small number of ingredients, indicates that the ingredients, especially cereals treated with thiram, occasionally gain entry into animal /bird feeding. There should be a quality assurance programme in every intensive feed manufacturing unit as a routine basis to detect thiram contamination in feed ingredients to prevent serious damage to the health and productivity of animals / poultry.

Key words: thiram, feed ingredients, thiram poisoning

INTRODUCTION

Thiram is an ectoparasiticide. The full chemical name is tetramethylthiuram disulphide. It is used as a fungicide, seed protectant, animal repellent, rubber accelerator and bacteriostat in soap. It is available as dust, flowable, wettable powder, water dispersible granules and water suspension formulations. It is most commonly used in mixtures with other fungicides. It is applied as post harvest in a number of seed crops including small and large seeded vegetables, cereal grains, cotton seeds and soybeans. It is applied to protect the seeds from a possible fungal attack and thereby sustain germination potential of the seeds in agricultural practices.

As the seeds mixed with thiram gain entry mistakenly / intentionally into animal feed manufacturing, its toxicity is not uncommonly observed in poultry and animals. A study was undertaken to investigate the occurrence of thiram (qualitative) in various feed ingredients and in feeds.

MATERIALS AND METHODS

A total of 636 samples (214 maize, 100 jowar, 259 bajra, 13 other feed ingredients, and 50 compounded feeds inclusive of cattle and poultry feeds) submitted by farmers, feed ingredient suppliers and feed manufacturers to Animal Feed Analytical Quality Assurance

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Laboratory, Veterinary College and Research Institute, Namakkal between years 2007 to 2012 for qualitative screening of thiram (AOAC,1995). 50g of sample taken in a 250 ml conical flask was added with 50 ml chloroform and shaken for 30 minutes. The contents were filtered through Whatmann No: 1 filter paper. To the clear filtrate, a pinch of cuprous iodide was added. After one hour the development of stable amber colour indicated presence of thiram.

RESULTS AND DISCUSSION

The occurrence of thiram in feed ingredients is shown in the table 1. Thiram was found in few cereal commodities and complete feeds analysed. Among the cereals analysed jowar was found to be showing higher percentage (5%) of positive incidences (5/95) followed by Bajra at 1.16 per cent (3/256). However only one maize sample was found to be contaminated with thiram out of 213 samples. In other ingredients analysed, incidence of thiram was not observed. The incidence of thiram poisoning is higher in the year 2010 both in raw ingredients and feeds probably indicating that the raw material contaminated with thiram could have been used for feed manufacturing. The study indicates that the thiram that has been used as a seed protectant in cereal grains gained entry in to the feeds. Many authors reported thiram poisoning in poultry. Levels of thiram ranging from 100-150 ppm in the rations of hens, quail and partridges inhibit egg laying (Lorgue *et al.*, 1996). Guitart *et al.*, (1996) also reported an outbreak of thiram poisoning in Spanish poultry farm and contaminated poultry feed caused soft egg shells, depressed growth and leg abnormalities in one million birds and found corn as the source of contamination that was previously treated with thiram. Waibel *et al.*, (1955) noted that number of eggs laid was reduced when laying hens were fed seed corn treated with thiram. Experimentally, thiram was found to decrease body weight significantly even at 15ppm level in

commercial broilers (Subapriya *et al.*, 2007), to cause tibial dyschondroplasia in growing chickens (Vargas *et al.*, 1981) and in turkeys (Simsa *et al.*, 2007,) and to significantly reduce oviduct weight at 250 ppm in laying hens (Weppelman *et al.*, 1980)

SUMMARY

The occurrence of thiram in feed ingredients and feeds were investigated. The presence of thiram though in small number of ingredients, indicates that the ingredients especially cereals which are treated with thiram for protecting germination percentage in agricultural practices occasionally gain entry into animal /bird feeding. There should be a quality assurance programme in every intensive feed manufacturing as a routine basis to effectively find thiram contamination before it could gain entry into feed manufacturing and cause serious damage to animals / poultry.

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Table: 1

Occurrence of thiram in various poultry feed ingredients and feeds

Feed Ingredient										
Year	Maize		Sorghum		Bajra		Others		Feed (cattle & poultry)	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
2007	–	20	–	10	–	23	–	3	–	1
2008	1	91	–	25	1	107	–		–	1
2009	–	40	–	7	–	–	–	1	–	10
2010	–	49	4	14	2	52	–	3	4	19
2011	–	9	1	8	–	65	–	4	–	6
2012	–	4	–	31	–	9	–	2	–	9
Total	1	213	5	95	3	256	0	13	4	46