

AFLATOXIN IN FEED, FARM GATE MILK AND SELECTED COMMERCIALY AVAILABLE MILK

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INTRODUCTION

Mycotoxins are low molecular weight, non-antigenic fungal secondary metabolites, which are formed at the end of the exponential growth phase of an organism, and make no contribution to the development or metabolism of the producing organism. (Frazier & Westhoff, 1988). Mycotoxins are able to develop at any stage from farm to fork as shown in Figure 1.

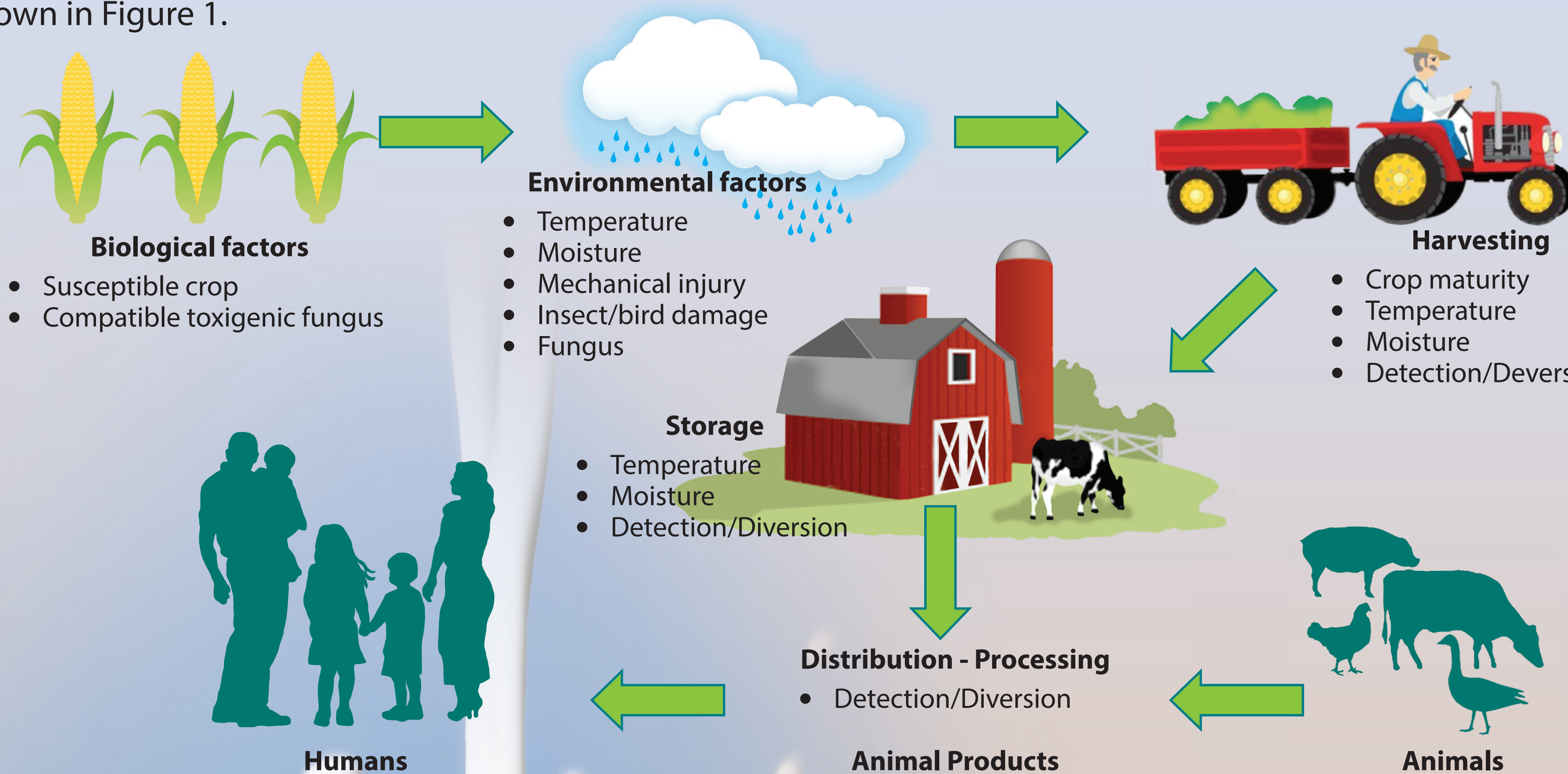


Figure 1: Factors which affect mycotoxin occurrence in the food chain (CAST, 2003).

Aflatoxin B₁ is a mycotoxin found in most feeds and foods and is highly carcinogenic (Eaton and Gallagher 1994) and once ingested by ruminants, it is converted to aflatoxin M₁ (AFM₁), a carcinogen under the influence of the cytochrome P₄₅₀ oxidase system found in rumen micro-flora (Yoshikawa *et al.* 1982) (Figure 2).

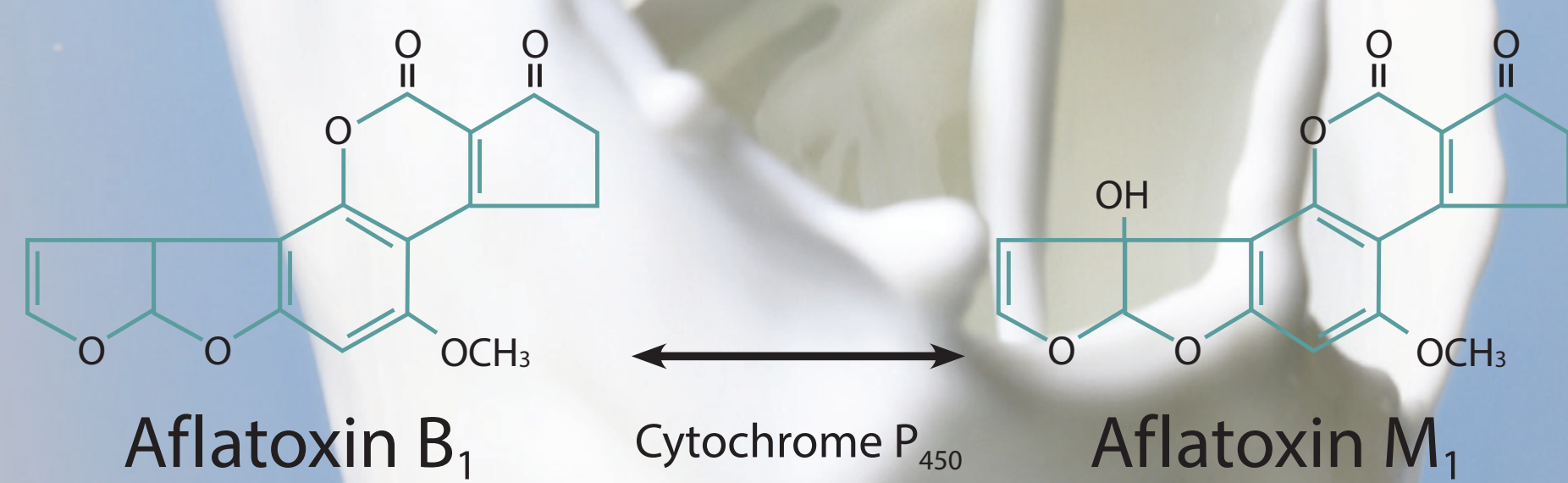
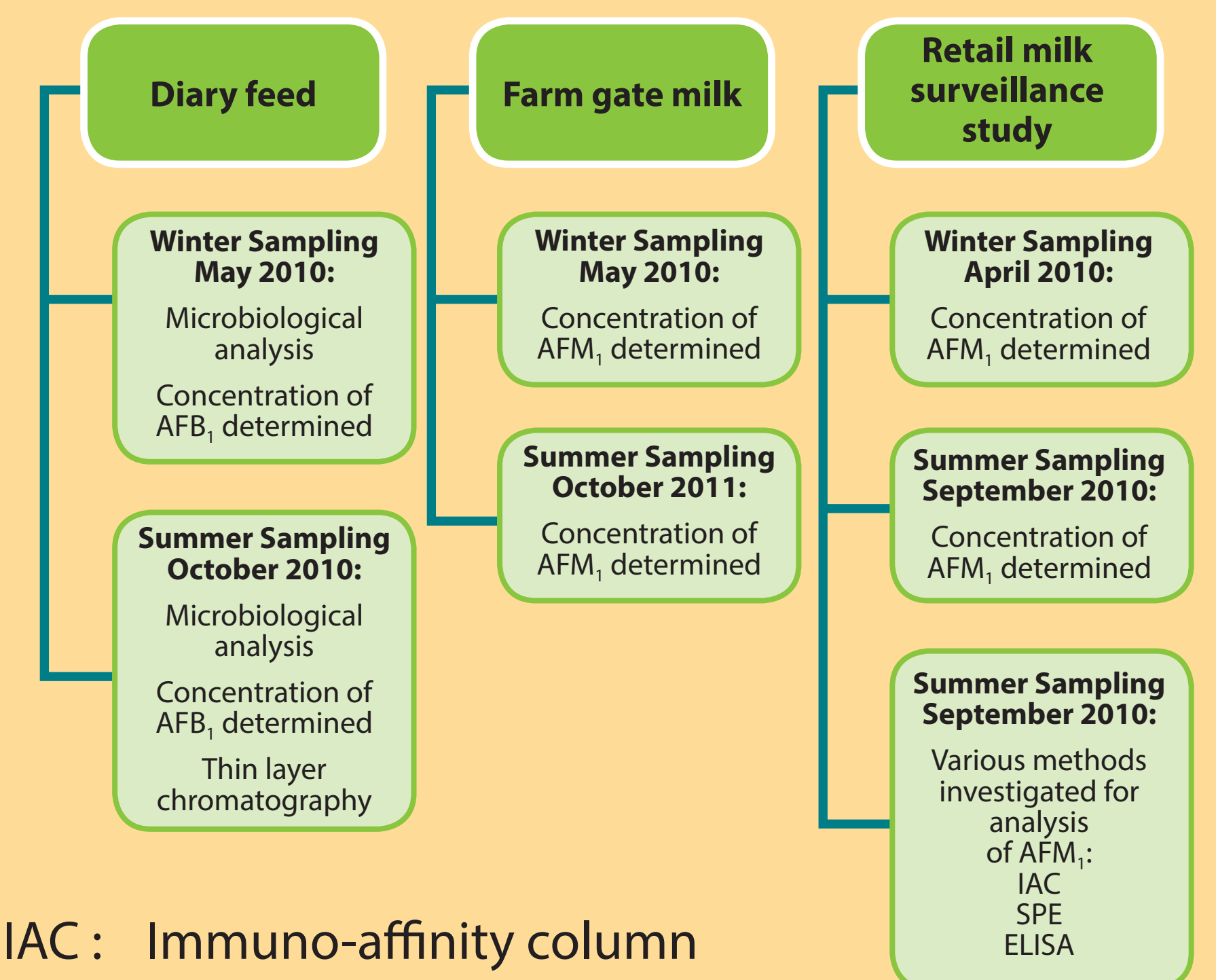


Figure 2: The Formation of Aflatoxin M₁ from Aflatoxin B₁

METHODS

The following diagram outlines the sampling procedure and methods of analysis employed for this study.



IAC : Immuno-affinity column
SPE : Solid phase extraction
Elisa : Enzyme linked immunoassay

Fig 3: A summary of sampling procedure and analysis conducted on feed and milk

RESULTS

The graph below demonstrates that all the feed samples tested for Aflatoxin B₁ exceeded the permitted level as prescribed by South African legislation

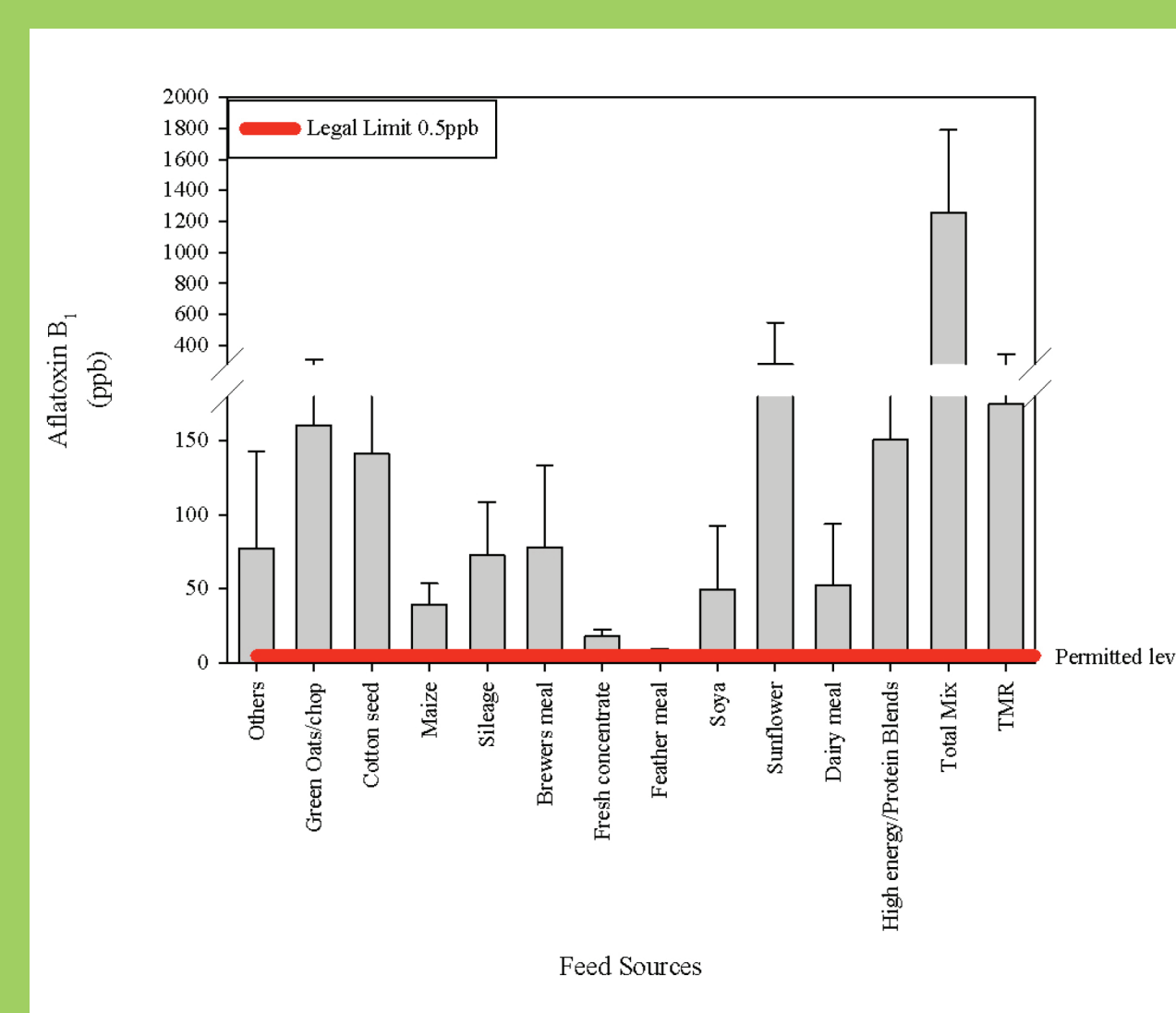


Figure 4: Quantification of aflatoxin B₁ by HPLC in the various feed ingredients together with the permitted legislated level.

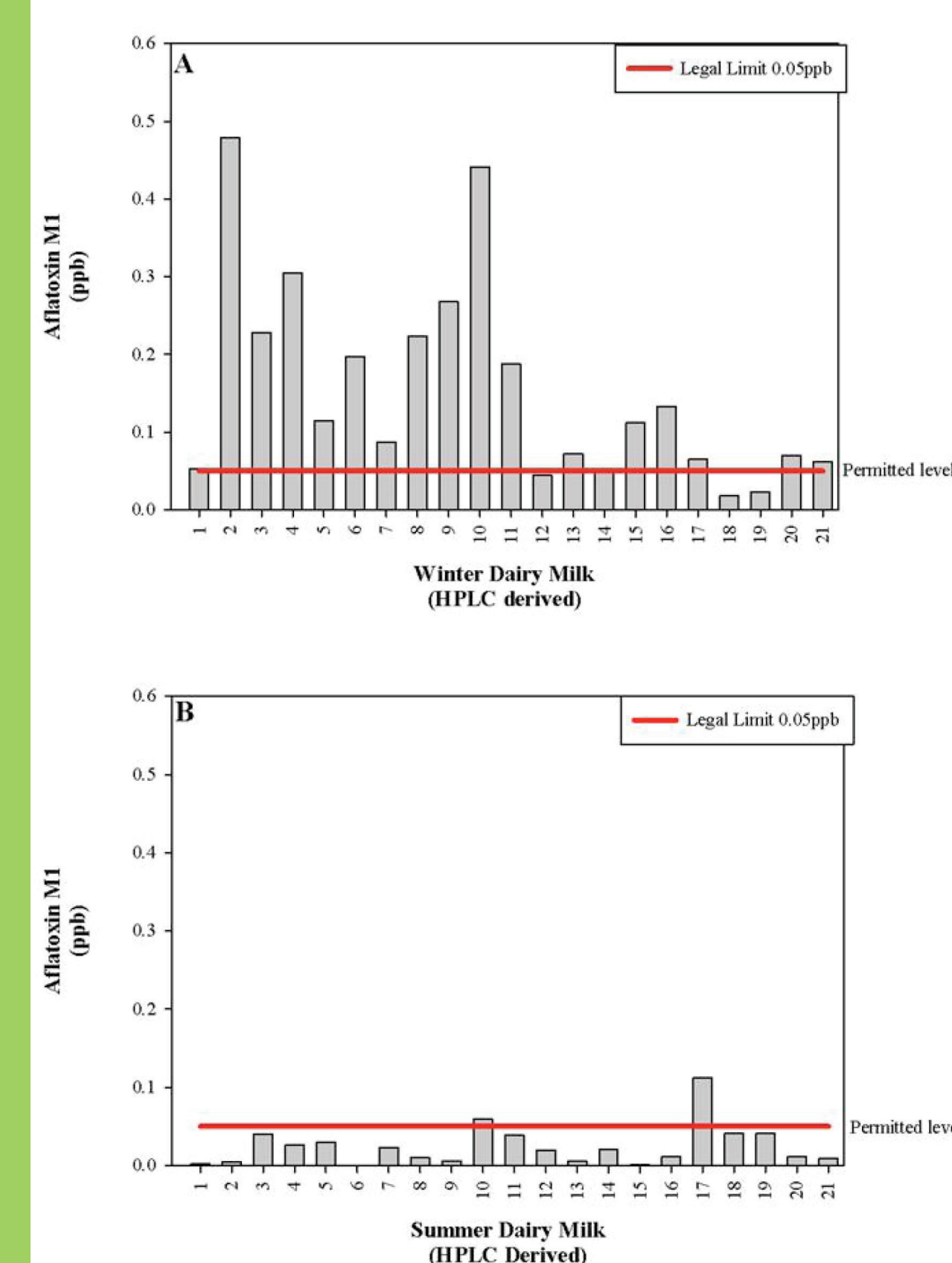


Figure 6: The quantification of aflatoxin M₁ in retail milk sample together with the permitted legislated level as reported in **winter** (A) and **summer** (B)

OBJECTIVES

- To conduct a surveillance study of selected retail milk samples
- To determine levels of AFB₁ in feed and AFM₁ in milk from selected farms in Kwa-Zulu Natal

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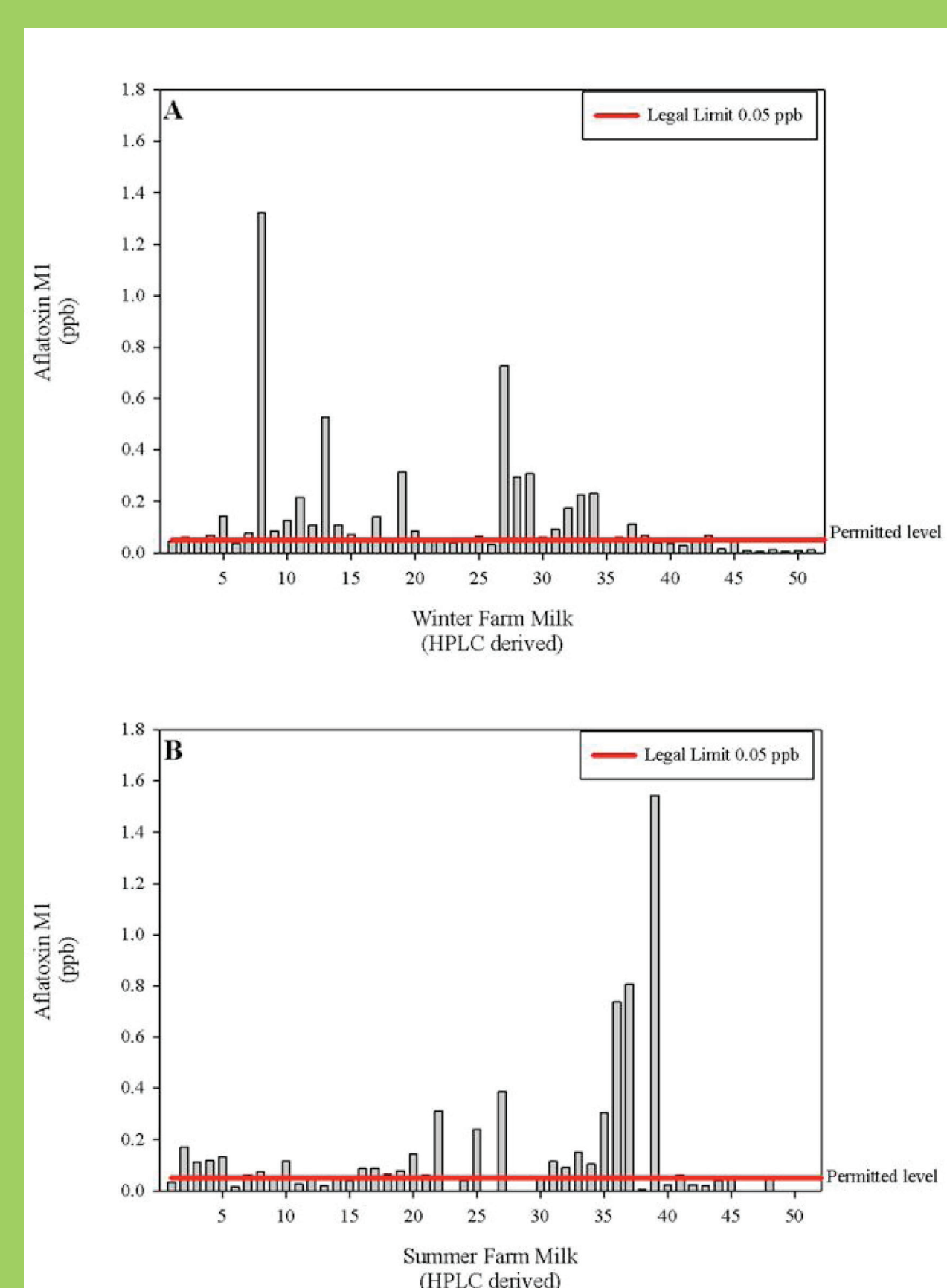


Figure 5: The quantification of aflatoxin M₁ in farm gate milk samples together with the permitted legislated level as reported in **winter** (A) and **summer** (B)

CONCLUSION

There are serious concerns regarding the levels of AFB₁ contamination in the dairy feed supply chain which contributes to the presence of AFM₁ in commercially available milk. Farmers need to be educated re mycotoxins their prevention, control and effects. Intervention from government and import officials is needed to ensure stringent quality control over imported materials.



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