ASSESSMENT OF TOXIGENIC FUNGI IN POULTRY FEED

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Introduction

Feed supplies the necessary nutrients for the growth of healthy animals, which are a part of the human diet. The presence of toxigenic fungi in animal feed such as *Aspergillus* spp. may contribute to 1) the loss of nutritional value of feedstuff, since fungi will assimilate the most readily available nutrients present in the feed [1], and 2) the development of mycotoxicoses [2] and chronic conditions, which can raise economic issues due to animal disease and contamination of animal derived products.

Aim of study

The goal of this work was to evaluate the incidence of *Aspergilli*, particularly from the *Circumdati*, *Flav*i and *Fumigati* sections, through real-time quantitative PCR (qPCR) in 11 feed samples.

Materials and Methods

Feed samples (20g) were suspended in 180 mL of distilled water and homogenized during 20 minutes at 200 rpm. The washed supernatant was then processed for DNA extraction using the ZR Fungal/Bacterial DNA MiniPrep Kit and subsequent amplification and detection of the target DNA fragments.

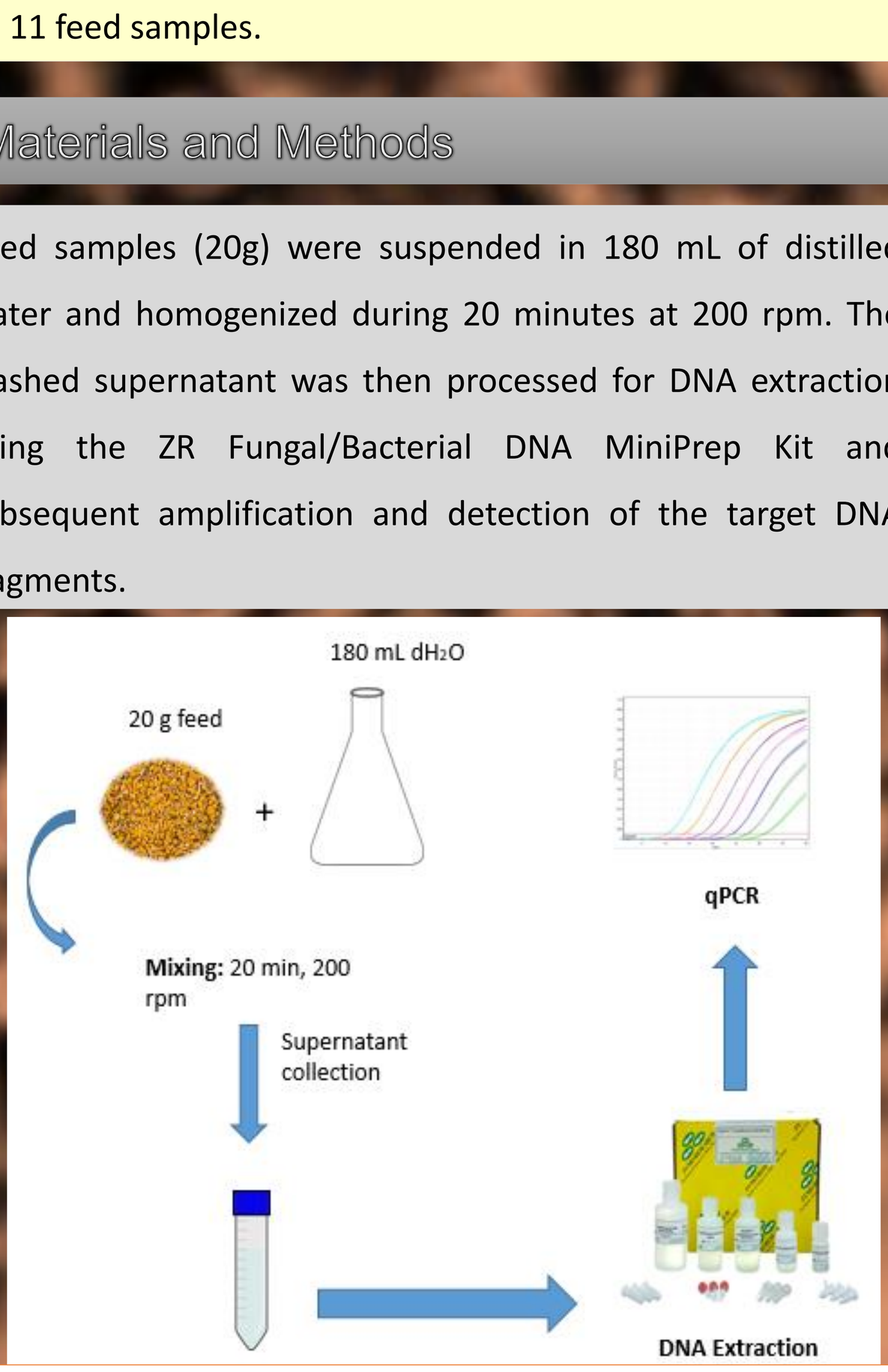


Figure 1 – Methodology schematics

Results and Discussion

Six of the eleven feed samples (55%) analyzed tested positive for the presence of DNA from the *A. fumigatus* complex, however *Flavi* and *Circumdati* sections were not detected.

Table 2 – Ct values obtained for the *Fumigati* section. N.A – No amplification.

Samples	Ct value (*Fumigati*)
Positive control	17.7
1	N.A
2	32.77
3	32.7
4	N.A
5	N.A
6	32.73
7	35.88
8	33,39
9	N.A
10	29.14
11	N.A

The results regarding fungal burden point out for the possible presence of gliotoxin and other mycotoxins produced by *Fumigati* section[3].

Future work

To confirm the presence of mycotoxins in feed samples, which can be present long after fungal elimination, we will analyze directly mycotoxins and try to understand the most important variables that influence mycotoxins production.

References

1 – M. Greco, M. Franchi, S. Golba, A. Pardo, G. Pose (2014). Mycotoxins and Mycotoxigenic Fungi in Poultry Feed for Food-Producing Animals. The Scientific World Journal.

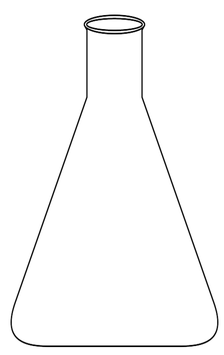
2 – F. Berthiller *et al*. (2013). Masked mycotoxins: A review. Molecular Nutrition and Food Research, 57, 165-186.

3 – C. Viegas, J. Malta-Vacas, R. Sabino, S. Viegas, C. Veríssimo (2014). Accessing indoor fungal contamination using conventional and molecular methods in Portuguese poultries. Environmental Monitoring and Assessment.. 186, 3: 1951 – 1959.

20 g feed

+

180 mL dH_2O

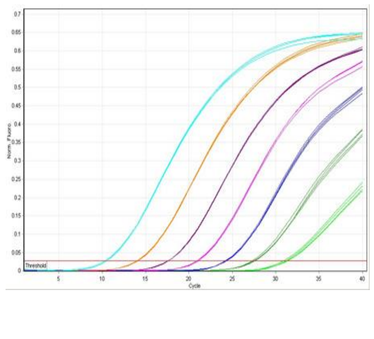


Mixing: 20 min, 200 rpm

Supernatant collection

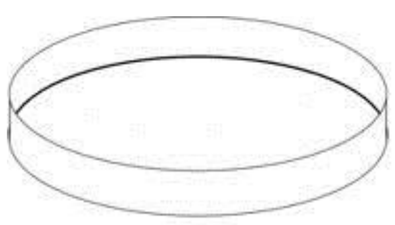
Molecular methodologies

DNA Extraction

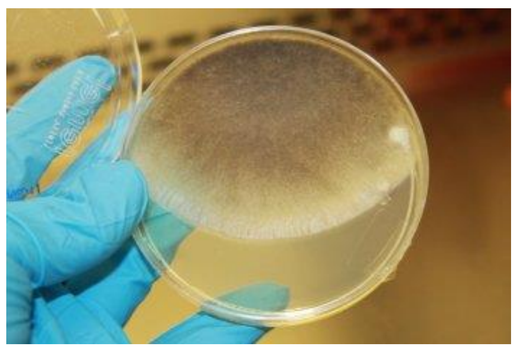


qPCR

Conventional methodologies



Innoculation onto DG18 media



Fungal counts