

Title New parameters to evaluate forage quality
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Citation Postharvest Biology and Technology, Volume 41, Issue 2 , August 2006, Pages 215-224
Keywords Forages quality; Aflatoxin; Deoxynivalenol; *Aspergillus*; *Fusarium*; Dairy cattle

Abstract

The preservation of feedstuff for animal consumption (forages) by fermentation or dehydration is a common practice to supplement pastures and achieve better yields. Currently, the quality of a forage has been evaluated only through chemico-fermentative parameters. However, animals' health can also be affected by the presence of bacteria, molds, and/or some of their metabolites, e.g. mycotoxins.

The quality of 147 forage samples (55 sorghum, 49 lucerne, and 43 maize) used for feeding dairy cattle, was evaluated using chemico-fermentative (pH, ammonial nitrogen/total nitrogen ratio) characteristics, fungal propagule counts, and the presence of *Aspergillus fumigatus* and mycotoxins (aflatoxins and deoxynivalenol).

Most lucerne samples (55.1%) were of bad chemico-fermentative quality (risky for consumption). In addition, a high percentage of samples (38.8% lucerne, 65.1% maize and 69.1% sorghum) presented Fairly Good (doubtful) chemico-fermentative characteristics.

Maize samples showed the highest frequency of contaminated samples by high counts (25.6%), followed by lucerne (with a lower fermentative sugar content) (18.4%), and sorghum (16.4%). The mycoflora was distributed in 59 species belonging to 26 genera. In all forages, molds were the most numerous isolates, with the greatest number of isolates being *Aspergillus* species (17% isolates) with numerous isolates in the section Flavi, followed by *Penicillium* (9.7%) in maize, *Fusarium* (12.3%) in lucerne, and *Byssoschlamys* (8.5%), *Fusarium* and *Geotrichum* (6.1% each) in sorghum.

Even though the lucerne and maize samples presented a high mycotoxin incidence, and in most of them the simultaneous presence of AF and DON was detected, average values were not very high (AF: 6.78 and 6.96 µg/kg, DON: 1666.67 and 717.50 µg/kg, respectively for lucerne and maize). The high degree of contamination registered in the samples (81.6% lucerne, 67.4% maize and 45.5% sorghum) indicates the need for improving the technology applied during the development of crops, their harvest and the preparation and conservation of forages. It could be determined ($p < 0.05$) that AF + DON are contamination markers in lucerne and maize silages. In sorghum forages, a significant association ($p < 0.01$) was detected between risk and storage method.