

## Evaluation of rapid tests for the quantitative aflatoxin measurements in maize

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Several rapid test systems can be found on the market to determine the aflatoxin content in different matrices based on lateral flow devices. During the joint project "AflaNet – networking on aflatoxin reduction in the food value chain" founded by the German Ministry of Food and Agriculture, a number of different test kits were evaluated for their general applicability, procurement costs and comparative results. The aim of the investigation was to examine the performance in general and to issue recommendations for the applicability of rapid tests under sub-Sahara conditions. Keeping in mind that less trained persons (such as farmers) should be able to detect aflatoxins simply, properly and safely to ensure the daily food is safe to consume.

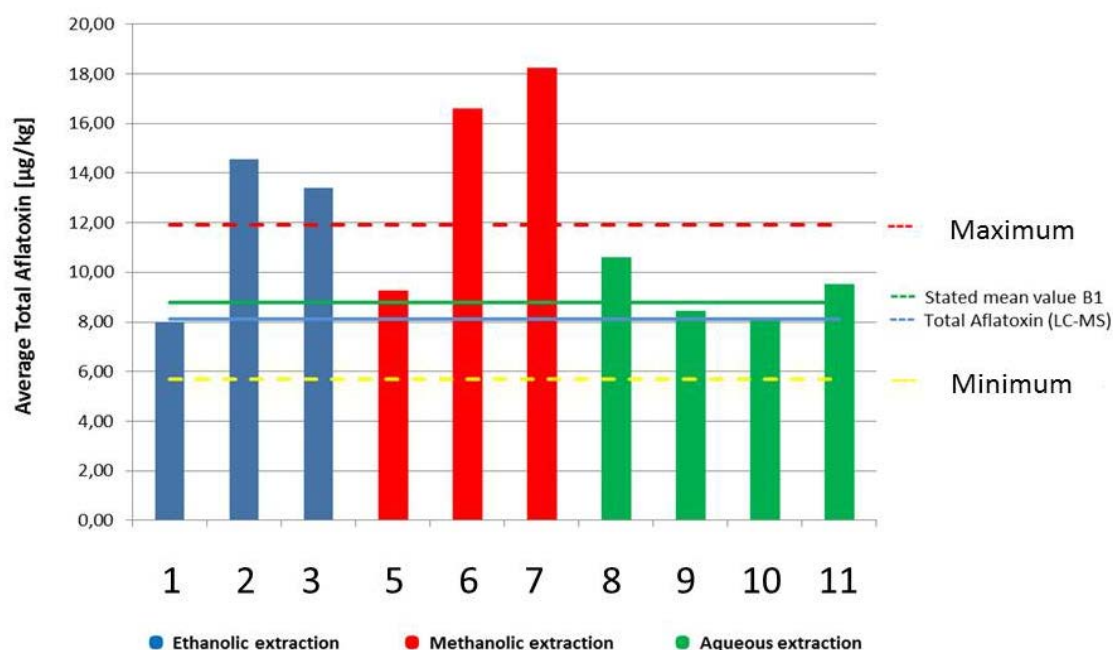


Fig.1 Comparison of the results of different rapid tests of reference material with certified content of  $8.8 \mu\text{g/kg} \pm 3.1 \text{ AFB1}$  ( $\text{AFB2}$ ,  $\text{AFG1}$  and  $\text{AFG2} < 1 \mu\text{g/kg}$ ) conducted with different extraction solvents. The average of min. 12 independent tests for each box is shown.

The average results of repeated extractions of the reference sample gave divergent content of the certified maize material (figure1). Moreover, different extraction solvents seem to be more or less suitable for the determination of aflatoxin content when conducting rapid tests.

Due to the high fluctuation of the values of natural contaminated samples, several rapid test devices are less appropriate for a single determination. The risk is high of making a wrong decision regarding the destruction or use as food of the corn batch based on only one measurement. Moreover, the evaluated devices are all expensive and thus only affordable for agricultural communities but not for a single farmer with low income. Overall, we came to the conclusion, that one rapid test might be suitable for field use under harsh conditions. However, our examinations provide very differing values, so that a recommendation can hardly be expressed until now. Beside a reliable test strip a mobile analytical system is desirable which should be free of charge, universal applicable and can be loaded onto existing devices e.g. mobile phones which are present today everywhere in the world.

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