



The First International Symposium on Food and Agro-biodiversity (ISFA2014)

Infection of *Aspergillus flavus* and Physical Quality of Peanuts Collected from Farmers, Local Markets, and Processors

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ABSTRACT

Sixteen peanut samples collected from farmers, collectors, retailers and food processors in Banjarnegara District, Central Java were analyzed for their physical quality and *A. flavus* infection. On average, the moisture content of peanut kernels was 8.8%, while the damaged kernels (46.7%) and *A. flavus* infection (45.1%) were considerably high. Six, five and five samples were infected by non-toxic (-), slightly toxic (+), and toxic (++) *A. flavus*, respectively. Infection of *A. flavus* positively correlated with damaged kernel ($r = 0.71$). This suggests that high damaged kernels and infection of *A. flavus* need to be decreased through proper handling and storage practices.

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Peer-review under responsibility of the organizing committee of Indonesian Food Technologist Community

Keywords: peanut, *A. flavus* infection, physical quality.

INTRODUCTION

The predominant use of peanut production in Indonesia is for foods (92%) [1], such as sauces for salads, snacks (boiled, fried, roasted, flour coated, pastry fillers, confectionary, traditional snacks) and to a lesser extent for tempe/*oncom* (fermented defatted peanut) and industrial products, like oil, peanut butter and flour. Therefore, food safety issue becomes

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essential as peanut is highly susceptible to aflatoxin contamination, which is hazard toward humans and animals. In addition to carcinogenic, teratogenic, and mutagenic capacities, aflatoxin may also cause immuno suppression [2].

Aflatoxin is a secondary metabolite of *Aspergillus flavus*, *A. parasiticus*, and *A. nomius* [3], which is favourably produced at 15-30% moisture content of the substrate/media, warm (25-30°C) and humid (85% RH) conditions of the surrounding air [4]. Indonesia has established the maximum level for aflatoxin B₁ as low as 15 ppb for peanut food products and 20 ppb for total aflatoxins [5]. However, a number of studies showed that aflatoxin B₁ levels in peanut kernels and products were higher than that of permitted level [6-13].

Infection of *A. flavus* and aflatoxin contamination may occur either in the field or during storage. Post harvest handling, such as harvesting, threshing, drying, as well as methods and conditions of storage would dictate the moisture content and physical quality of peanut kernels, which considerably associates with *A. flavus* infection [7, 14]. Therefore, post harvest handling at stakeholder levels (farmers, collectors/traders, processors) plays an important role in dictating aflatoxin contamination levels at different points of peanut production and marketing/distribution. Normally, it takes about 40-110 days for peanut marketing from harvesting to consumer [6]. In particular, higher contamination levels were reported for peanut samples obtained from retailers in traditional markets relative to those from farmers and collectors [7, 9, 11, 15].

Therefore, the moisture content, physical quality, and levels of *A. flavus* infection in peanut kernels collected from farmers, collectors, retailers, and processors were essential to be studied, particularly in peanut producing area, such as Banjarnegara district. The total peanut production of this district was about 3,835 tons, which contributed 22% and 5% to Central Java and national production, respectively [16]. In this area, peanut is normally grown in the rainy season in upland and in the beginning of the dry season in rainfed land.

MATERIALS AND METHODS

This study was conducted in Banjarnegara district, Central Java province, Indonesia as a supplement for similar study which was done previously in seven sub-districts, namely Bawang, Purwonegoro, Banjarnegara, Mandiraja, Purworejo Klampok, Wonodadi, and Punggelan [15]. About two kg of peanut kernels or dry pods were collected (stock samples) from two farmers in Rakit and Purworejo Klampok sub-districts, two collectors in Mandiraja and Purwanegara sub-districts, 10 local market retailers in Purwanegara, Purworejo Klampok, Rakit, and Bukateja sub-districts and two peanut processors/collectors in Bukateja

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