THE EFFECTS OF PHOSPHINE ON STORAGE FUNGI OF SOYBEAN MEAL

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The effects of phosphine on storage fungi as well as on aflatoxin production and moisture contents of soybean meal were investigated. The soybean meal was stored for 190 days at a BULOG (National Logistics Agency) warehouse. Four stacks of soybean meal were treated twice with phosphine (2 g/ton), at the beginning of storage and at 95 days. The length of each treatment was 5 days. Each stack consisted of 20 bags (50 kg/bag). Four other stacks were used as control. The fungi were isolated using the dilution method, aflatoxin was analysed using thin layer chromatography, and the moisture contents were determined using the oven method.A completely factorial randomized design was used in this study. During the storage, 17 species of fungi were isolated, *Aspergillus candidus*, *A. Flavus, A. niger, A. penicilloides, A. sydowii, A. tamarii, A. wentii, Cladosporium cladosporioides, C. sphaerospermum, Endomyces filbuliger, Eurotium chevalieri, E. repens, E. rubrum, Mucor circinelloides, M. racemosus, Penicillium citrinum* and *Wallemia sebi*. The predominant species were *A. sydowii, E. chevalieri* and *W. sebi*. The total fungal population of treated stacks was significantly lower (1649 colonies/g) than that of untreated ones (5273 colonies/g). There was also a significant difference in the total population of certain species of fungi during storage. The fungi were *A. niger, A. penicilloides, A. tamarii, Endomyces fibuliger, M. racemosus* and *W. sebi*. Phosphine may have also reduced the aflatoxin B_1 accumulation. The aflatoxin B_1 content of the stacks treated with phosphine (12 ppb) was lower than that of untreated stacks (21 ppb). Aflatoxin content increased with the increase of the storage period. There were no significant differences in the moisture contents between stacks treated with phosphine and untreated stacks. However, the moisture content decreased with the increase of the storage period in both treatments (treated and untreated stacks). In the stacks treated

with phosphine the moisture content was between 11 - 14%, while in the untreated stacks it was between 10.7 - 14.5%.