In general, Indian joss stick brands emitted more PAHs and carbonyl compounds compared to the local brands. This research is an attempt to glance at the exposures which can be prevented through simple measures such as controlling the indoor combustions.

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Low cost eco-friendly polyethylene film for packaging of wheat flour

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At present polymer packaging industry is compelled to use PET based polymeric materials to manufacture packaging materials for food packaging including wheat flour. Though these PET based materials possess the required properties these materials are very expensive and non recyclable. Therefore many researchers are investigating the possibilities of manufacturing polyethylene based packaging materials, which are eco-friendly to replace expensive PET based materials.

In this study an effort was made to identity good quality low cost eco-friendly products for packaging of wheat flour. The trials were carried out using different blends of LLDPE, LPDE and high molecular weight PE. In this study packaging materials were produced using the multi-layer co-extrusion technique. Both field trials and laboratory trials were used to analyze the samples. As the most efficient packaging system for flour is form-fill seal machine system, prepared samples was sent to packaging plants to check whether the sample was able to reach the required runability at form-fill seal machine. The physical properties such as tensile strength tear strength and puncture resistance were measured. Depend on observed values PE blends were gauging down to minimum tolerance limit to contain up to 1kg relative dense products. The Water Vapor Transmission Rate (WVTR) of the film also measured because the shelf life of wheat products very heavily depends on its water activity. Finally a low cost eco-friendly PE based packaging material for wheat flour was developed.

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Eutrophication and poultry industry: Issues, challenges and opportunities

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Eutrophication is the process of excessive growth of algae and cynobacteria due to over enrichment of the surface waters with mineral nutrients. Eutrophication restricts water use for fisheries, recreation, industry and drinking. Phosphorus (P) is the limiting mineral for the eutropication process. Experience from America, Europe and Australia clearly shows that improper land application of poultry litter is among the main contributors of eutrophication process. Poultry utilizes dietary phosphorus rather inefficiently, due mainly to high level of phytate in their diets and, low intrinsic phytase activity both in poultry and plant materials. Phytates increase the excretion of N and a range of other cations and, thus increases the eutrophic potential of poultry litter. Poultry industry of Sri Lanka expanded dramatically during the last few decades and it has been predicted that the growth will continue. Meanwhile, use of poultry litter as an organic fertilizer is becoming popular, particularly in up country cropping systems. The risk of getting water bodies eutrophicated due to the present trend of indiscriminate land application of poultry litter in up country cropping systems is tremendous. Estimated minimum annual P output from local poultry industry is around 751.8 metric tonnes. Decreasing the P level in faeces through dietary manipulations is probably the most cost-effective and practical approach to reduce the P losses to the environment. In poultry ration formulation, the requirement of P is expressed as the non-phytate P requirement. No upper limits have been set for the total P level in the diet. This has given the liberty to the feed industry to use poorly digestible plant P sources in the diets. From environmental point of view, it is important to set maximum total P levels for poultry diets. Supplementation of poultry diets with microbial phytases can reduce the faecal P levels by about 30% and also faecal N and other cation levels. Regulatory mechanisms should be imposed to make the use of phytase compulsory, at least when the total dietary P levels exceed a particular limit. A range of chemical and physical means are also available to increase the P utilization in poultry. Both farmers and the feed industry should be encouraged to adopt those strategies. A maize variety with reduced

phytate level has been successfully genetically engineered. Such genetically modified rice varieties are very much needed because the excretion of P is greatly increased when poultry diets contain rice bran. The dietary P levels commonly used in industry exceed the most recent NRC recommendations by about 15%. Many recent researches have shown that the dietary P levels could further be reduced without the performance being affected. The poultry feed industry should respond to these new findings rapidly and reduce the P levels in poultry diets. The dietary P requirement gradually declines as birds grown and mature. Theoretically, it is possible to prepare a series of diets containing decreasing P levels, and the feeding of such a series of diets as birds grow can reduce the P excretion. This paper concludes that the excretion of P from poultry industry could substantially be reduced through dietary manipulations and, timely intervention of policy makers, farmers and researchers is of paramount importance for the sustainability of inland water bodies.

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Evaluation of pesticide impact rating index (PIRI) model as a pesticide risk indicator

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Systematic methods for assessment of potential risk of pesticides to the environment can be considered as valuable tools in decision-making and policy formulation. Pesticide Impact Rating Index (PIRI) is a user-friendly simple risk indicator and it can be used to rank pesticides in terms of their mobility. The predictions given by using PIRI for the pollution potential of pesticides on shallow ground water bodies of Kalpitiya area in Sri Lanka was compared with the field experiments. Cultivated areas of Kalpitiya peninsula were selected for field trials.

Oxyfluorfen for onions, Chlorpyrifos, Diazinon, Dimethoate, Carbofuran, Carbaryl, Methomyl, Imidacloprid, Fenthion and Captan for chili were applied in replicates at recommended application rates for particular crops. Each area was irrigated at the rate of 20 mm/day. The soil considered was the sandy soil with the organic matter of 1.6±0.2%. Residue levels of applied pesticides were measured using Gas Chromatographic and High Performance Liquid Chromatographi methods in irrigation wells in 100 m diameter area at 3 m depth for 3 months in one week intervals from the time of pesticide application. The detected pesticides were confirmed using Gas Chromatographic Mass Spectrophotometric method.

Out of applied pesticides, Dimethoate, Carbofuran, and Chlorpyrifos leached 3 m water table in 24±4 days, 25±3 days and 35±6 days respectively after application of each pesticide. The field monitoring results were 74% compatible with the predictions from PIRI. This indicates that PIRI can be used as a simple risk indicator model for the prediction of pesticide risk to water bodies.