Poultry

Natural pigments for improving egg yolk colour

Attractive colours always attract consumers. Better yolk colour is preferred. The density of the yellow pigment in egg yolk is closely related to the xanthophylls in the ingredients used to constitute the layer diets. Marigold anthers, marigold petal meal, algae, clover meal, maize gluten meal and yellow maize in layer diets are known to be used to improve the yolk colour.

Prabakaran and his team at Madras Veterinary College, Chennai studied the inclusion of two commercial powder products, Cromophyl 20 and Biored in layermash to improve egg yolk colour. Cromophyl 20 and Biored (BIOQUIMEX) contain xanthophylls derived from marigold flowers (***Tagetes erecta* Linn.**) and chillies (***Capsicum annuum* Linn.**), respectively.

A total of 1750 laying hens, 66 weeks old were divided in 7 groups and fed standard basal diet along with Cromophyl 20 and Biored in different combinations. The layers were fed continuously for 30 days and 12 eggs of uniform size were collected from each group on every 10th day from the start of the experiment. Inclusion of these products in layer diet was not found to influence egg production. The results revealed that Cromophyl-20 and Biored can be used either alone or in combination in layer diets to improve the egg yolk colour intensity especially when such diets are prepared with lower levels of maize. They may preferably be used @200 and 1200 g per tonne of feed, respectively to obtain eggs with the most preferred yolk colour by consumers. The cost of inclusion of these pigments varied from 3 to 5 paise per egg produced (Prabakaran *et al, Indian Vet J*, 2001, **78**, 416).

Pulp & Paper

Wheat straw for paper making

The process by which raw materials are pulped produces large amounts of water waste of a highly polluting nature, especially in sulfite- and sulfate-based process. This can be overcome by removing fibre and lignin using suitable organic solvents. Although the effectiveness of such solvents has been known for long, they have only recently been used for this purpose at pilot- and small-scale industrial plants. Organosolv processes have been applied with varying success to hard and soft wood and also to a lesser extent, to non-wood materials. One such material is wheat straw.

Current pulp output is inadequate to meet the increasing demand, particularly in developing countries; this is leading to an increasing shortage of wood raw materials and to gradual deforestation of some areas in the world. This makes non-wood materials such as wheat straw and various other agricultural residues attractive alternative for pulp making.

Jimenez and others from Spain used central composite design to examine the influence of the independent cooking variables and the number of PFI beating revolutions, in the organosolv pulping of wheat straw with ethanol-acetone-water mixtures, on the yield and Shopper-Riegler of the pulp and on various properties of paper sheets obtained from the pulp in order to establish the optimum operating conditions for the process.

A comparison of the properties of the pulp and paper sheets obtained by ethanol-acetone pulping conditions with those provided by ethanol pulping and acetone pulping under similar conditions revealed that ethanol pulping provides pulp with best Shopper-Riegler index, breaking length and stretch (52.96°SR, 6276 m and 2.39%), respectively, acetone pulping yields a higher burst index (3.63kN/g) and ethanol-acetone pulping provides a higher tear index (3.5 mNm^2/g). On the other hand, ethanol-acetone pulping provided a higher yield and ethanol pulping a lower one (53.15% and 41.98%, respectively).

Hence acetone pulping and ethanol-acetone pulping (the latter provides an increased yield) are the best choices for obtaining pulp requiring no subsequent refining; otherwise, ethanol pulping is a better choice than the previous two [Jimenez *et al*, *Bioresource Technol*, 2002, **83**(2), 139-43].