

**A Comparative Study on Water Vapour Permeability
of Surface Treated Paperboards with Keratin and
Gammalu (*Pterocarpus marsupium*) Latex**

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ABSTRACT

Chicken processing industries produce a high amount of feathers as a wastage, which caused disposal problems. Chicken feathers contain a high percentage of Keratin; a protein, which shows good resistance towards water. Gammalu latex is naturally available resource in Sri Lanka, which has high barrier properties. Extracted Keratin and Gammalu latex can be applied as a coating on the surface of paperboards for biodegradable packages in order to improve the barrier properties against water vapour permeability, while preventing the environment pollution caused by thermoplastic polymers. Thus, the present studies were mainly focused on the extraction of Keratin from chicken feathers and develop a coating to paperboards, and compare the properties of that with a coating made of Gammalu latex. Pre-treated chicken feathers were undergone on a feathers dissolving, protein precipitation, protein purification and film preparation processes. Paperboard (0.25 g/cm^2) coated with 2% (v/v) Glycerine with Keratin & 2% (v/v) Glycerine with Gammalu latex were used as treated samples. Non-coated paperboards used as the control samples. All samples were stored in a climatic chamber at controlled environment. Water vapour transmission rate was evaluated under three different temperatures (30°C , 35°C & 40°C) and relative humidities (60%, 65%, 70%) for three weeks. Data were analyzed using two-way ANOVA technique in Minitab 17. Results showed significant difference ($P < 0.05$) amongst the treated samples while Keratin showed least water vapour transmission rate followed by Gammalu latex coated paperboards. This study revealed that Keratin coated paperboards could be used as an effective packaging material with low water vapour permeability.