



UTILIZATION OF FEATHER WASTE TO IMPROVE THE PROPERTIES OF THE EGYPTIAN COTTON FABRICS

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ABSTRACT

This work aimed to use chicken feathers wastes (CF) as a natural source of active amino acids after alkali treatments with 0.95N NaOH solution. The soluble feather was analyzed by the liquid chromatography and applied to both the mercerized and bleached cotton fabrics from cotton varieties namely Giza 89 (G89), and Giza 90 (G90) of crop season 2002/2003. The treated and untreated fabric samples were tested for their mechanical properties expressed as the tensile strength N/cm^2 , and elongation%. The dyeing behavior expressed as color strength (K/S) using Kubelka-Munk equation, and UV protection values were also investigated. The fixation of CF on the cotton fabric was done by the padding of CF solution onto fabrics followed by dry-cure process. The factors affecting the fixation processes were systematically studied. The finished fabrics show sufficient whiteness, high tensile strength, more dyeing uptake, and more reduction of the UV transmitted as compared to the untreated samples.

Keywords: Egyptian cotton, chicken feathers, feather waste

1. INTRODUCTION

Approximately two or four billion bounds of poultry feathers are produced every year by the poultry producing industry^[1]. Poultry chicken feathers represent about 6.0% of the total weight of mature chicken lead to environmental problems as waste – by product at commercially poultry plants^[2-5]. Most of the feathers are usually ground up and used as filler for animal^[6-7]. However, this use has the potential to pass harmful bacteria along to the animals that ingest the feather meal. CF is bio-source with high keratinaceous protein content (more than 750 g kg^{-1} crude protein).

Walter Schmidt^[8] has patented a method of removing the stiff quill from the

A fiber that make up the feather. Now, with pilot plants starting to use this technology to produce pure fibers and pure quill material. Polyethylene-based composites are prepared using keratin feather fiber obtained from CF's^[9-10]. Keratin fibers are mixed into high-density polyethylene at 20 wt% using a Brabender mixing head. George et al.^[11-14] twisted 1-to-2 inch-long turkey feather fibers with nylon to make yarns, which they knitted into fabrics. In strength tests, the yarn was weaker than pure nylon, but the fabrics insulated better than nylon cloth. The researchers transforming turkey-feather fibers into nonwoven Erosion control fabrics. They also use a common textile instrument that blows the feather material into a fragile, half-inch-thick mat that's loosely held together by friction between the