

Potential Utilization of By-Product Feeds Varying in Fiber Level and Fiber Composition by Poultry

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With the high cost of production encountered today, poultry producers are continually looking for ways to reduce operating cost. One potential method to cut feed costs is the incorporation of by-product feeds into poultry rations. By-product feeds can frequently supply energy and protein, but, unfortunately, they often contain 20 percent or more crude fiber. Incorporation of high fiber feeds into poultry rations reduces productivity if the birds are not able to adjust their feed intake up and maintain adequate energy consumption. Fiber characteristics that limit feed consumption in poultry, if any, are not well understood, and information is needed to ensure that by-product feeds can be adequately utilized.

A preliminary trial was initiated in the fall of 1981 to examine what influence purified fiber sources added to a nutritionally complete basal diet would have upon feed intake, rate of ration passage through the gastrointestinal tract and body weight of 16-day-old chicks. Purified fiber sources fed to chicks constituting 40 percent of the ration included wood cellulose, lignin¹ and hemicellulose² as well as polyethylene, a synthetic fiber. The degree to which fiber sources influenced the parameters measured varied ($P < .05$) among fiber sources even though they were all present at a level of 40 percent of the ration composition. Ration intake (pounds per 100 birds per day), ration digestibility (percent), relative ranking for rate of feed passage (1 = fastest rate, 5 = slowest rate) and body weight gain (pounds per day per 100 birds) were, respectively, 2.2, 53, 2, .76 for the basal ration; 2.8, 47, 3, .4 for basal plus cellulose; .8, 31, 4, -.6 for basal plus hemicellulose; 2.5, 32, 5, .65 for basal plus lignin; and 3.3, 33, 1, .73 for basal plus polyethylene.

Purified fiber sources should not be considered as a homogeneous class even though they are all highly indigestible. Fiber characteristics such as density, water absorbing capacity, particle size and palatability may be responsible for the differences observed. Deleterious effects caused by hemicellulose addition appeared to be due to the ration's forming a sticky material during consumption. This material held the birds' beaks together and thereby inhibited feed consumption. Postmortem analysis indicated that birds fed the ration high in hemicellulose performed poorly due to starvation. Whether the fiber effects observed in this study for the purified sources are exhibited in natural feedstuffs containing these fibers is unknown. Additional work in this area is under consideration.

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