



IFAS EXTENSION

By-product Roughage Feedstuffs for Dairy Cattle¹

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By-product roughages are frequently used as alternative roughage sources when good quality silage and/or hay is not readily available at competitive prices. Also, some by-product roughages such as cottonseed hulls (CSH) are very palatable, easy to mix in rations and provide excellent bulk and effective fiber. By-product roughages are almost always mixed with the concentrate portion of the ration in various amounts depending on other available sources of roughage. Complete feeds or total mixed rations (TMR) may contain up to 30 to 35% CSH or about 19% crude fiber (air dry) when other roughages are absent. In general, most dairymen use lesser amounts of by-product roughages (15 to 25%) and some hay or silage.

COTTONSEED HULLS

Cottonseed hulls are used extensively as a roughage source in Florida and to a limited extent in other southeastern states. They are low in protein and energy but high in effective fiber (43%). They may be used as the only source of roughage but are more commonly used in combination with limited amounts of silage and/or hay. Cottonseed hulls are very palatable and cows receiving such rations consume about 15 to 25% more dry matter than cows receiving silage-based rations (Table 1). They are sometimes

included in finely textured concentrate mixes to provide bulk and texture as well as supporting the fat percent. Fuzzy cottonseed hulls are preferred over delinted cottonseed hulls. Also, pelleted cottonseeds have been used in dairy cattle rations (Table 2).

PEANUT HULLS

Peanut hulls are used primarily as a roughage extender during periods when cottonseed hulls and other sources of roughage are scarce or expensive. Only coarse or fan-blown peanut hulls contain effective fiber and are considered equal or slightly higher than cottonseed hulls in effective fiber. They are used most often to replace one-third to one-half the cottonseed hulls in a ration. They are very low in energy and if finely ground, are low in effective fiber. Peanut hulls are palatable to dairy cattle and if needed, should be used in lower producing groups because of their low energy content.

RICE HULLS

Rice hulls have little to no value as a feedstuff and should be used primarily for bedding material. They are high in silica and fiber. The effective fiber value is about 35% and the TDN 15%. During extreme roughage shortages, ground rice hulls may

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substitute for 10 to 20% of the other roughages in the ration.

COARSE GROUND CORN COBS

Coarse ground corn cobs are similar to cottonseed hulls in feeding value but slightly less palatable. They are used primarily as a roughage extender in rations rather than as a major roughage source. In recent years ground corn cobs have been unavailable.

SUGARCANE BAGASSE

Sugarcane bagasse is the fibrous residue of sugarcane stalks which remain after the juice is removed. Sugarcane bagasse pellets are fed like cottonseed hulls and are similar to cottonseed hulls in feeding value. Dairymen prefer CSH over bagasse pellets due to the physical appearance of the feed. Cottonseed hulls tend to stay in the ration much better. In recent years, bagasse pellets have been unavailable as a potential feedstuff due to its high fuel value at the sugar mill. They are no longer produced in Florida.

GROUND CORRUGATED BOXES

Ground corrugated boxes are occasionally used as a source of roughage in dairy cattle rations. They are very bulky and less palatable than cottonseed hulls. They do contain excellent effective fiber (65%) and energy (70% TDN). Ground corrugated boxes may be used in complete feeds at the rate of 10 to 20% of the total ration dry matter (Table 3). Since rations containing ground corrugated boxes are consumed much slower than CSH rations, more time is needed at the feedbunk. Moist feeds containing corrugated boxes are consumed more readily than dry rations.

Table 1. A comparison of complete feeds containing either silage or 35% pelleted cottonseed hulls.

Roughage source	DM intake (lb/d)	Milk yield (lb/d)	4% FCM (lb/d)	Fat (%)
Corn silage	45.4	53.9	46.3	3.06
Cottonseed hulls	54.3	57.4	51.1	3.27
DM = dry matter. FCM = fat corrected milk.				

Table 2. A comparison of cottonseed hulls (CSH), pelleted CSH, and undelinted PCSH in complete feeds (air-dry basis).

Treatment	Feed intake (lb/d)	Milk yield (lb/d)	Fat (%)	FI/MY
Regular CSH (30%)	52.9*	44.6*	3.38*	1.18*
Pelleted CSH (30%)	49.8**	47.1**	3.91**	1.04
Pelleted UCSH (30%)	49.9	46.0	3.22	1.08
** Means in same column with different superscripts differ (P<.05).				

Table 3. A comparison of complete feeds containing either cottonseed hulls (CSH), ground corrugated boxes (GCB), or combination of GCB and peanut hulls (PH) (air-dry basis).

Component	Feed intake (lb/d)	Milk yield (lb/d)	Fat (%)
30% CSH	51.6	50.0	3.29
20% GCB	39.9	49.5	3.30
10% GCB, 10% PH	44.5	50.7	3.2