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South Dakota Farm and Home Research

South Dakota State University

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Cover photo:
This family is in the minority. Not even half of South Dakota residents picnic in a lakeside park, or fish, or camp. Even less engage in the more active outdoor sports. An article in this issue reports these findings and discusses some of the implications for the future.

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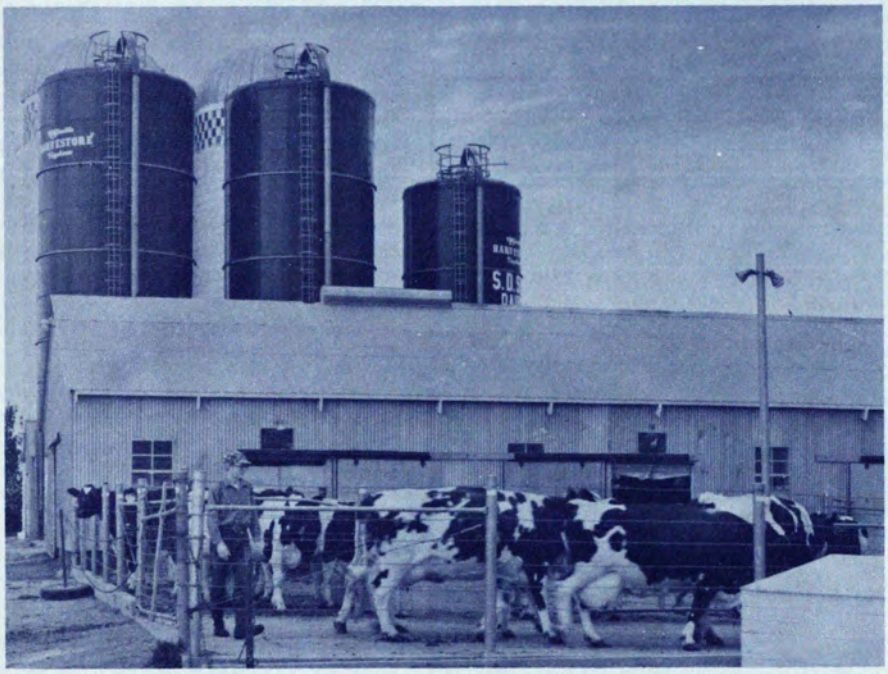
Alfalfa haylage gains from addition of dried whey

Alfalfa haylage is already top quality feed. Add dried whey, and you'll get improved fermentation, digestibility, and palatability, and faster weight gains



Haylage is partially dried alfalfa—usually around 45% moisture—which is chopped and handled like alfalfa silage except that it is wilted more in the field before ensiling. It is more palatable than silage. There are fewer freezing problems, and less weight to be handled since it has less moisture.

It also has advantages over straight hay. Drying time in the field is shorter, so feeding value is higher. There are fewer chances of exposure to bad weather. Chopped alfalfa haylage can be handled mechanically, which is easier than feeding hay. Good quality alfalfa haylage is equal to or superior to good quality hay.

Alfalfa haylage is exceptionally high in protein. However, it is low in sugars. On many farms where storage and moisture conditions are not optimal for haylage, some supplemental carbohydrates may be needed to supply the sugars necessary for good fermentation.

Dried whey is a good source of readily fermentable carbohydrates since more than 70% of its dry matter is lactose, one of the simpler sugars and therefore easily converted to acids. South Dakota is a major cheese producing state, thus a large supply of whey is available.

Feed grade whey is sometimes available at relatively low prices. In some areas liquid whey is available, which could possibly be used in place of dried whey. However, because of the great volume of liquid whey needed, it would not be feasible to haul it long distances. Also, moisture control would be difficult.

Three experiments were conducted with dairy cattle to determine the preservation, digestibility, and feeding value of alfalfa haylage to which dried whey had been added.

Digestibility of all alfalfa haylage components goes up

First cutting alfalfa was finely chopped at about 50% moisture. The alfalfa was ensiled with 0, 1, and 10% dried whole whey on a dry basis. Four Holstein steers were used in a conventional digestion trial (Table 1).

Table 1. Fermentation characteristics and composition of haylages.

	Level of whey		
	(0)	(1%)	(10%)
pH	5.3	4.7	4.3
Lactic acid (%, dry matter)	6.2	11.6	13.0
Acetic acid (%, dry matter)	1.3	1.3	0.8
Dry matter (%)	40.9	44.9	50.9
Crude protein (%)	19.5	19.7	19.2
Cell wall contents (%)	50.8	49.8	43.2
Acid detergent fiber (%)	37.4	35.9	31.4
Cellulose (%)	27.4	24.8	21.2
Hemicellulose (%)	13.4	13.9	11.7

Table 2. Digestibility of alfalfa haylages fed to dairy steers.

	Level of whey		
	None	1%	10%
		(% digested)	
Dry matter	53.7	58.9	65.8
Energy	52.9	57.8	64.4
Crude protein	65.3	65.8	67.6
Ether extract	47.6	61.2	64.3
Ash	41.1	45.9	52.8
Cell wall	53.7	57.1	62.2
Acid-detergent fiber	50.5	54.7	57.2
Lignin	14.6	27.4	39.2
Cellulose	59.7	68.2	65.7
Hemicellulose	62.7	65.9	76.0

By **H. H. Voelker, D. J. Schingoethe,** and **L. D. Muller,** Dairy Science Department

The pH of haylage with whey added was lower than that which contained no whey, indicating that more fermentation had taken place. Lactic acid was higher in whey-treated haylages. Protein, cell walls, acid detergent fiber, and cellulose were influenced just by the changes due to composition of the whey.

Table 2 shows the effects of whey on haylage digestibility. Apparent digestibilities of dry matter, ether extract, energy, ash, cell wall, acid detergent fiber, lignin, cellulose, and hemicellulose were all increased with whey treatment.

Weight gains are faster than with straight haylage

Third cutting alfalfa-brome baled hay containing approximately 70% alfalfa and 30% brome was finely chopped with a field chopper. Dried whey was added at 1% of hay dry matter. Water was added to make 35% moisture reconstituted haylage. Materials were mixed and stored in an oxygen-limiting structure. The forages contained 16.4 to 17.4% protein, 34.5 to 36.7% acid detergent fiber, and 9.0 to 9.3% lignin.

Table 3. Response of cows fed hay and haylage.

	Group	
	Whey-haylage	**Hay**
Dry matter intake (lb daily)		
Forage	23.3	22.9
Concentrates	19.8	19.8
Total	43.1	42.7
Milk production (lb daily)	51.7	51.3
4% fat-corrected milk (lb daily)	46.6	47.3
Persistency of milk production (%)	93.8	92.8
Milk fat (%)	3.1	3.2
Body weight gain (lb daily)	+0.88 **	+0.33

** Highly significant.

Table 4. Response of dairy heifers to hay and whey-treated haylage.

	Group	
Measurement	**Whey-haylage**	**Hay**
	— lb —	
Forage dry matter intake daily	16.5	15.4
Av body wt	691.7	631.1
Av daily gain	2.2*	1.8
lb dry matter per lb. body wt gain	7.5*	8.6

* Significantly different

Table 5. Milking cow average responses to haylages.

Response	**0% whey haylage**	**2% whey haylage**
Dry matter intake (lb daily)		
Haylage	27.9	30.1
Grain and protein supplement	16.8	16.0
Total	44.7	46.1
Milk production (lb daily)		
Actual milk (starting period)	41.4	39.5
Actual milk (experimental period)	39.9	37.2
Persistency of production (%)	90.7	85.9*
Milk composition (%)		
Fat	3.75	3.62
Total solids	12.66	12.53
Protein	3.31	3.43
Cow body wt gain (lb.)	+33.4	+100.1**

* Significantly different
** Highly significant

Whey treated haylage and hay from the same source was fed in a 15-week milking cow trial using 20 Holsteins. A concentrate mix containing 16.8% protein and composed primarily of c[illegible] oats, soybean oil meal, urea, minerals and salt was fed according to production.

The results (Table 3) showed that forage consumption of whey-treated haylage and hay were similar. Milk quantity, persistency, and milk fat percentages were very similar. The cows on whey-treated haylage gained significantly more body weight than those on hay.

A companion heifer trial was conducted, using 24 Holstein heifers about 3 months of age. Groups were replicated with 12 heifers on each feed for 12 weeks. The results in Table 4 show that the heifers consumed slightly more forage dry matter from the whey-haylage than from hay. The heifers fed whey-haylage gained significantly more body weight than the cows and were more efficient in dry matter use.

Milk production is the same with or without whey

First growth alfalfa was cut about 3 weeks later than usual due to rainy weather. Alfalfa was in late bloom stage and was preserved in two oxygen-limiting silos, with 2% dried whey (dry basis) added to one silo. The silages were preserved for about 6 w[illegible] before feeding. The haylage composition was 56.6% dry matter, 4.3 kilocalories per gram of energy, 16.3% protein, 2.5% ether extract, 6.8% ash, 47.1% cell wall, 41.6% acid detergent fiber, 8.5% lignin, 33.1% cellulose, and 5.4% hemicellulose.

Twenty Holstein cows were balanced as nearly as possible for milk production and breeding groups, and pairs of cows were randomly assigned to one of two haylage treatments. This was a 12-week continuous trial with a 3-week preliminary period.

Fermentation characteristics were similar to those in Experiment 1. The results of the milking cow trial (Table 5) show that cows fed the whey treated haylage voluntarily consumed more haylage dry matter than those fed the untreated haylage. There was no significant difference in milk production. However, several cows fed each ration were in late lactation and thus may not have responded in production to haylage differences. The only beneficial effect of much significance was that cows gained more weight on the 2% whey-treated haylage.

A digestion trial was conducted at the same time as the milking cow trial. Haylage was the only source of feed four Holstein steers weighing about 400 lb in a conventional digestion trial

(Figure 1). As in Experiment 1, digestibilities of most constituents were significantly improved by the added whey.

To sum up, dried whey adds these bonuses to alfalfa haylage

1. Dried whey improved the fermentation of the haylage.
2. Dried whey significantly improved haylage digestibility. Dry matter digestibilities were improved 5 to 6 percentage points by adding 1 or 2% dried whey to haylage.
3. Palatability of alfalfa haylage appeared improved by whey preservation.
4. Milk production or milk composition of cows in late lactation was not increased by whey addition to haylage.
5. Cow and heifer body weight gains were significantly higher for whey-treated over untreated haylage. □

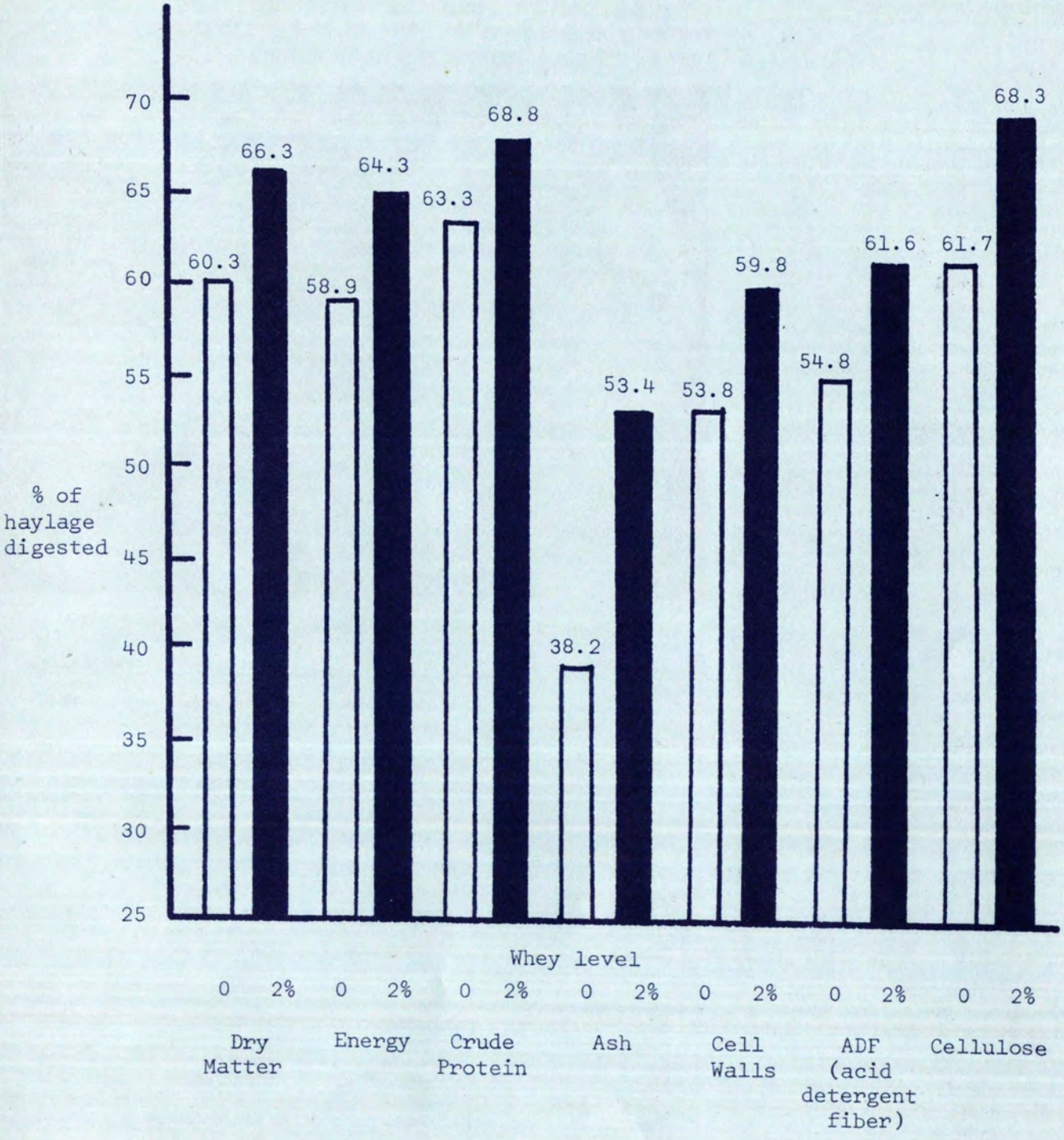


Figure 1. Digestibility of alfalfa haylage with or without added dried whey.

The back side makes a difference

Drapery selection is not just picking the prettiest color and pattern. Select that unseen side—the backing or lining—with just as much care, to shave money off your heating and cooling bills

A homemaker expects her draperies to last a long time. Since durability is important, an added lining will protect the drapery from deterioration due to sunlight. Linings also act as an added barrier to solar heat entering through windows. Linings may also reduce heat loss in cold weather.

Windows can represent about 15-30 % of the exterior wall area of a house. The heat that enters puts a large burden on air conditioning. Draperies and blinds can reduce heat gain as much as 50%, particularly if they are light in color and opaque. This will save money for the consumer. Air conditioning is the third largest energy user in the home and the costliest home appliance to operate.

The average family spends about 7% of its income on energy. Space heating is the largest energy user in the home, accounting for about ¼ of the total energy used. Draperies installed with tight closure at center opening and around the periphery of the window have been proven to reduce heat loss through windows as much as 21%, depending on the window seal.

The largest group in the drapery field is antique satin. Rayon and acetate have been used in the warps for about 65% of drapery fabrics. Self-lined draperies are now popular. The self-backings of acetate satin and acrylic foam, along with the new coatings on separate linings, give the consumer many choices.

Miniature draperies were used in fading and heat tests

Drapery fabrics for this study were purchased on the local market. Table 1 gives their specifications. They were measured for transmittance of heat in a controlled environment (temperature 70°F plus or minus 2° and 65% relative humidity plus or minus 2%).

Draperies (3-in heading and French pleating) were constructed to fit the 16x27-in opening simulating a window on the side of an insulated thermal cabinet. Inside was a thermostatically controlled heat source maintained at 100°F plus or minus 1°F.

A cornice extended 4¾ in over the cabinet opening with a 4-in drop on all sides. The draperies were hung on an end-curved rod placed under the cornice board. The drapery hung to within ½ in

By **Cora R. Sivers,** associate professor, and **Lillian O. Lund,** professor, textile research, Department of Home Economics

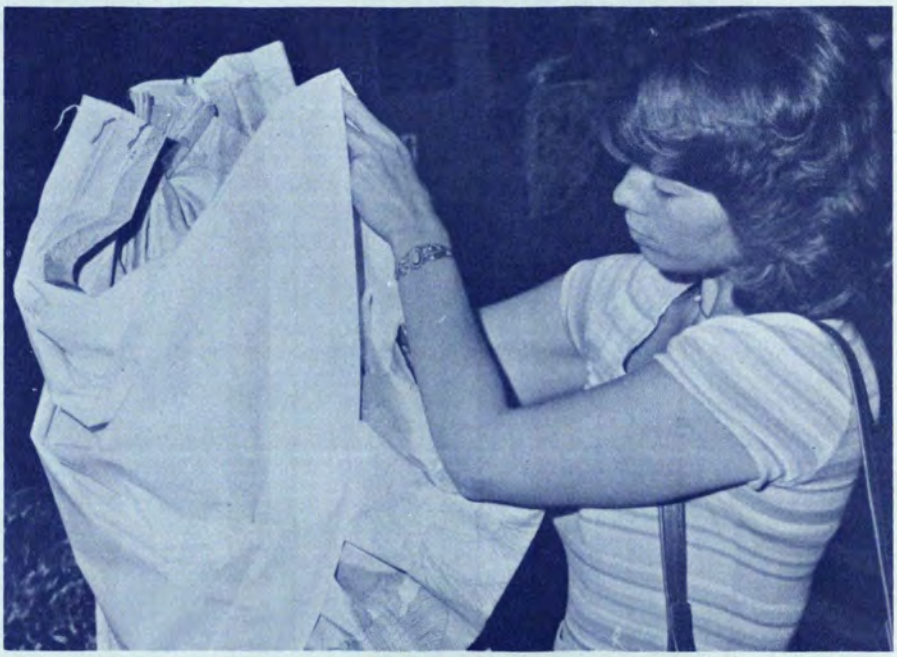


Table 1. Physical characteristics of new drapery fabrics and linings

Drapery-lining type	Color	Fiber content	Weight oz/sq yd
Drapery			
Antique satin	Indigo blue	69% Rayon	5.74
Acetate back	Black	31% Acetate	
Antique satin	Light green	69% Rayon	5.65
Acetate back	White	31% Acetate	
Self-lined			
Antique satin	Light green	50% Rayon	7.03
Acetate back	White	50% Acetate	
Antique satin	Slate blue	50% Rayon	8.16
Acrylic back	White	50% Acetate	
Damask	Royal blue	100% Rayon	8.12
Acrylic back	White		
Separate linings			
Twill	White	100% Cotton	3.67
Sateen	White	100% Cotton	3.26
Sateen	White	100% Cotton	3.22
Plain	White	100% Cotton	4.11
Coated back	White		
Plain	White	50% Polyester 50% Rayon	3.68
Plain	White	100% Acetate	2.61

of the floor with the lining facing the heat source in the cabinet.

An appliance wattmeter measured the watts-per-hour consumed while maintaining a constant cabinet temperature of 100°F. The watts-per-hour were recorded after a constant wattage reading was maintained for a 24-hr period with each drapery or drapery-lining combination. Less watts were used with the better insulators.

The materials were also exposed to a glass-enclosed carbon-arc lamp for 40, 80, and 320 Standard Fading Hours (SFH). Some fabric deteriorated appreciably, while others only changed color slightly.

The FDA-RC Fade-Ometer, simulating day and night cycling effect, was used. This exposure leaves the test specimens in the cabinet 24 hrs a day under a cycle of 3.8 hrs light, at a black-panel temperature of 145°F, followed by one hr without light while the humidity in the test chamber is raised to and maintained at a relative humidity of 85-95%. Degradation of the fabrics was evaluated by residual strength, using the ravelled strip method.

Linings improved insulative values by up to 30%

Two unlined drapery fabrics showed highly significant statistical differences for thermal insulating values, although the only actual difference was color. The white-backed drapery used 22.49% less watts per hour than the black-backed drapery, indicating better insulation with the white backing (Fig. 1).

When the black-backed drapery was covered with various separate white linings, more radiant heat was reflected and less absorbed, thus improving its insulative value by up to 30%.

Adding the same separate linings to the white-backed drapery made these combinations even better heat barriers. Air held between the drapery and added lining afforded more insulation than the single drapery.

Some separate linings were more effective insulators than others. There was a better insulative value for the black back when the plain weave lining was thermal coated. The plain weave lining of acetate fibers had a significantly better insulative value than the polyester/rayon lining. The sateen weaves had a difference in thread count, but little difference in insulative value.

Self-lined draperies compared favorably with the drapery-separate lining combinations. The acrylic foam-backed draperies were slightly better insulators than the woven acetate back; however, they weigh approximately 1 oz/sq yd more.

Under simulated sunlight (the carbon-arc lamp), the black-backed drapery lost 3.23% of its original strength and the white 3.90%, after 320 SFH of exposure. The coated plain weave lining gave the most protection to both black- and white-backed draperies after 320 SFH, with the loss in tensile strength being 1.49 and 1.82%, respectively. All of the linings, with the exception of the 100% acetate, gave protection to the black-backed drapery, resulting in only 1.24 and 2.48% loss in tensile strength.

The self-lined antique satin draperies lost considerably more tensile strength—19% for the acetate-backed and 27% for the acrylic foam-backed.

The linings were significant in preserving the original color of the unlined drapery fabrics after 320 SFH (Table 2). The face of the indigo blue black-backed drapery, unlined, rated 4.0 on the Gray Scale 1-5 (5 indicates no change), and the face of the light-green white-backed drapery rated 3.6. The indigo blue drapery rated 4.5 with each of the six different linings; and the light-green drapery rated 5.0 when paired with the thermal coated cotton lining, and 4.8 and 4.9 with all other linings except the cotton twill combination which rated 4.5. The self-lined draperies all rated 5.0, signifying no change in color.

The addition of a lining, whether separate or as self-backing, is a better heat barrier than an unlined drapery.

Linings (self or separate) do give protection in preserving the original drapery color.

Degradation of the drapery fabric is significantly lessened with the addition of a separate lining. The drapery with separate lining showed less strength loss than the self-lined drapery. □

Table 2. Color change of face fabrics after 320 Standard fading hours in the Fade-Ometer

	Color rating*
Drapery	
Antique satin - black back	4.0
Antique satin - white back	3.6
Self-lined	
Antique satin - acetate back	5.0
Antique satin - acrylic back	5.0
Damask - acrylic back	5.0
Black back drapery with separate linings	
Twill	4.5
Sateen	4.5
Sateen	4.5
Plain (coated)	4.5
Plain (rayon/polyester)	4.5
Plain (acetate)	4.5
White back drapery with separate linings	
Twill	4.5
Sateen	4.8
Sateen	4.9
Plain (coated)	5.0
Plain (rayon/polyester)	4.8
Plain (acetate)	4.9

* Gray Scale Rating, 1-5
(5, indicating no change in color)

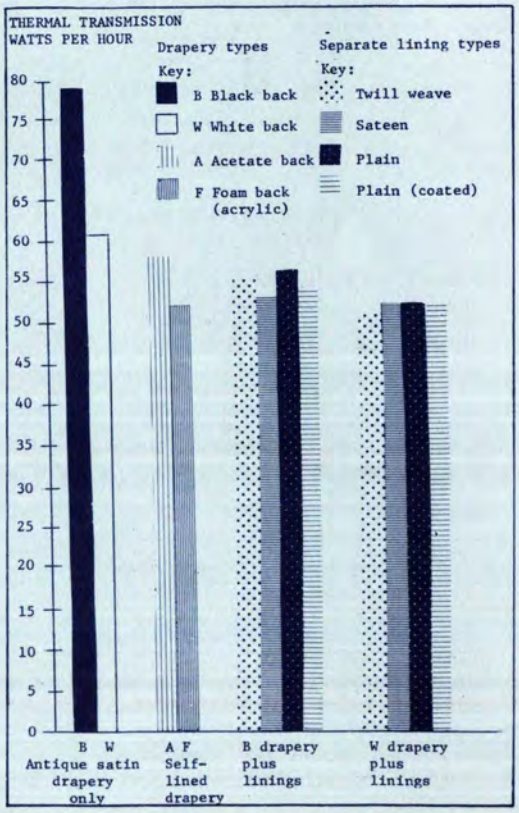


Chart 1. Thermal insulation value of drapery types with and without linings.

Figure 1. Thermal insulation value of drapery types with and without linings.

Spotting the protein in bread wheat

After boards are in use at country elevators, farmers will get their premiums for high protein wheat without waiting for chemical tests at terminal markets

MINNEAPOLIS Cash Grain Closing Prices

SPRING WHEAT

For Dry Sound Milling Wheat Basis 13.5% Mst.

Ordinary	$3.73*—$3.73*
11% Protein	3.83*— 3.83*
12% Protein	3.98 — 3.98
13% Protein	4.13 — 4.13
14% Protein	4.39 — 4.39
15% Protein	4.61 — 4.61
16% Protein	4.85*— 4.85*
17% Protein	4.95*— 4.95*

WINTER WHEAT
Basis Future July $4.08
DELIVERED

MONTANA—1 DHW or 1 HW

Ordinary	$3.64*—$3.65*
10% Protein	3.67*— 3.68
11% Protein	3.74 — 3.75
12% Protein	3.92 —
13% Protein	4.21*—
14% Protein	4.48*—
15% Protein	4.71*—
16% Protein	4.83*—

Test weight disc. 1c each lb. to 58 lbs.
Test weight under 58 lbs. subject to sharp discount.

MINN. & S. DAK.—1 DHW or 1 HW

Ordinary	$3.58*—$3.64*
10% Protein	3.58*— 3.67*
11% Protein	3.75 — 3.75
12% Protein	3.92 — 3.92
13% Protein	4.11*— 4.13
14% Protein	4.33*— 4.36
15% Protein	4.64*— 4.67*
16% Protein	4.74*— 4.79*

Test weight disc. 1c each lb. to 58 lbs.
Test weight under 58 lbs. subject to sharp discount.

Up to $1.22 more per bushel for hard red spring wheat. And $1.16 more per bushel for hard red winter wheat.

Those are the premiums that milling quality high protein HRS and HRW wheat can command over ordinary (12-13%) protein wheat at the terminal markets.

But you have to wait for that premium, and you may not get all of it. When wheat arrives at the market and a grade is placed on it, the protein is not determined then because U.S. Government Grain Grading grain standards do not account for protein content. The actual price of bread wheat at the market is not arrived at until the protein content has been determined.

Boards give a standard of comparison for spotting protein

That may be several days later. Protein content of wheat is determined by a chemical reaction test performed only by a well equipped laboratory supervised by trained personnel. This test can be made only at a terminal market or at most large elevators. If it is sent to a special laboratory there is a delay of one or more days after a representative sample has been sent in.

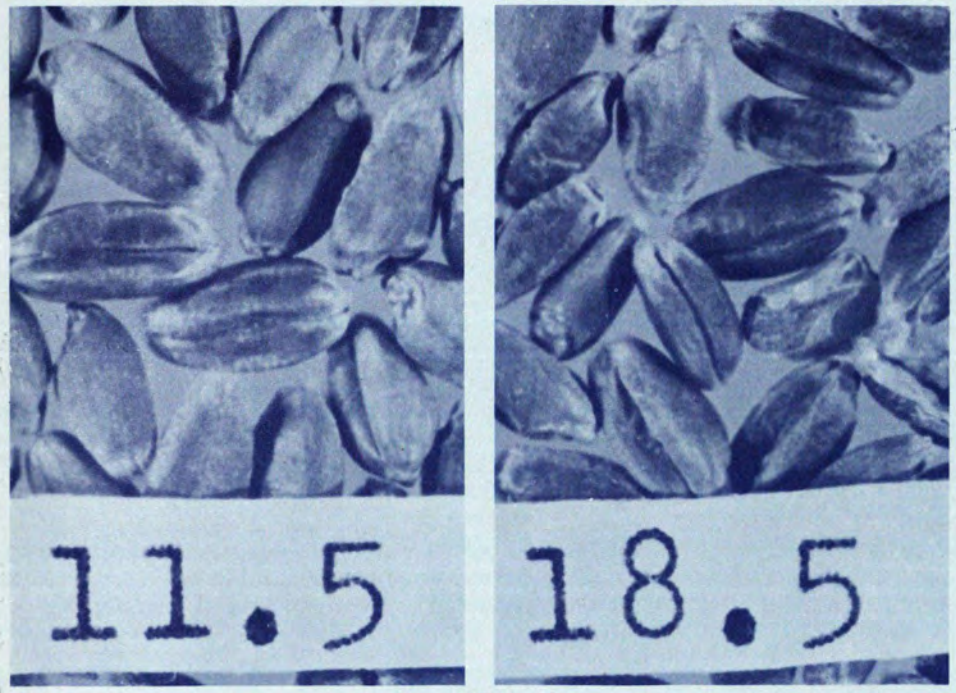
"Protein boards," developed in our labs at SDSU with grants from the South Dakota Wheat Commission, will be a quick, reliable, easy, and inexpensive method of determining protein in the field or at the country elevator, once these boards are in the hands of grain buyers throughout the state.

They are a refinement of the eye-balling method that experienced

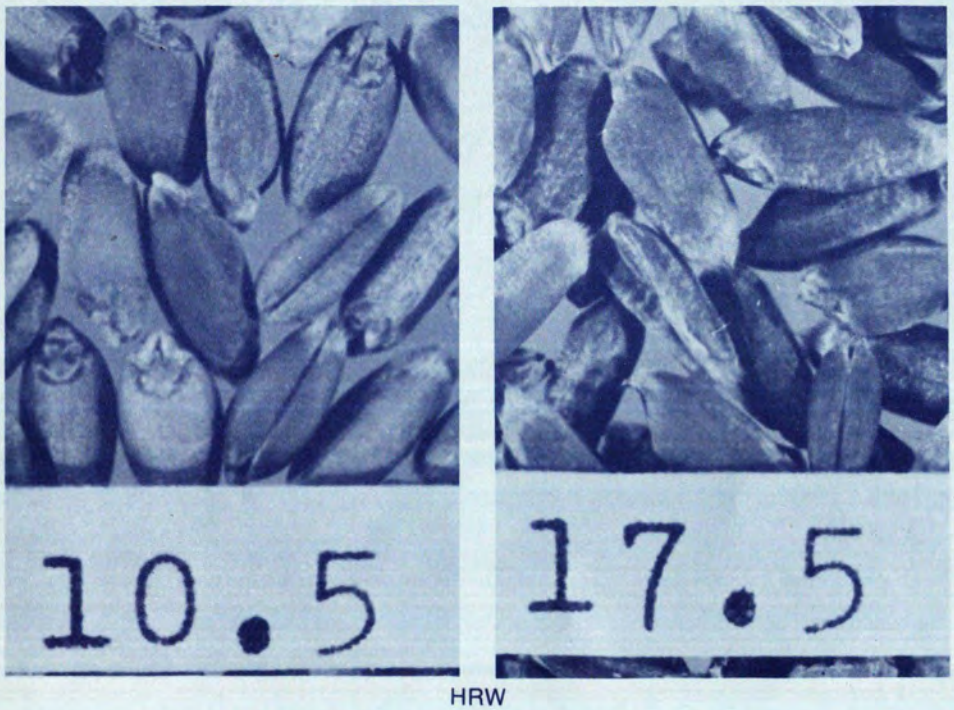
By **R. C. Kinch**, professor emeritus, Plant Science Department

grain handlers have picked up over the years. High protein samples of wheat have certain constant visual characteristics, while low protein samples have a considerably different set of relatively constant visual characteristics. Many people have become quite adept at estimating the protein content by noting the size, shape, and shades of color of the kernels.

But most people need a standard or measure of comparison to help in estimating protein content of a wheat sample. That's why the protein boards came into being.



HRS



HRW

The extremes in HRS and HRW wheats on the protein boards show up in darker red color, fewer soft, starchy kernels, and a shrunken appearance as the higher levels of protein are approached.

Why protein anyway?

Remember your mom's homemade bread? Every once in a while, she'd have a flop, "mice ran through the bread," she'd say. The loaf had so many holes that you got scolded when the jelly dripped through.

That's why millers and bakers are interested in high protein wheat. They don't want coarse bread full of holes, and the higher gluten content in high protein wheat prevents those holes.

Hard red spring and hard red winter wheats are the bread wheats. Not all production lots are high in protein. It mostly depends on the weather, but some varieties average higher in protein than others. A drought year, while it may cut yields, will raise the protein level.

Gluten is a tough, gummy substance formed from certain proteins found in HRS and HRW wheat. You'll get very little gluten from a durum; it's not a bread wheat.

Gluten keeps those big holes from forming. The yeast that raises the dough does it by giving off carbon dioxide. If this gas collects in large bubbles, the bread will be coarse. Gluten holds the bubbles down to size, and the bakers get bigger loaves with a more uniform texture.

Remember, too, that your mother almost surely cautioned you about stomping or slamming doors when she had a cake in the oven. Cakes are made from low gluten flour; they flop faster than breads.

Extremely high protein wheat is not that much better than just plain high protein, as far as the millers are concerned. They do, however, blend lots to achieve the right combination.

In one respect, the drought years have been kind to South Dakota wheat growers. Drought, especially the absence of moisture at maturity, helps raise the protein level in HRS and HRW wheat. Certain varieties also will develop high protein contents. □

Estimate usually will be no more than 1% off.

A board consists of eight representative samples of wheat under glass. They have protein contents ranging from 11% to 18% for HRS and 10% to 17% for HRW wheats, arranged at 1% intervals.

To arrive at truly representative samples, we collected hundreds of samples of HRS and HRW wheats from all the major wheat producing areas of the state over a 3-year period. The

samples represented a wide range in test weight, plumpness, shades of color, and protein content. We determined their protein content chemically, and arranged bulked samples within each 1% protein range on preliminary boards.

Students employed in the Seed Testing Laboratory and Plant Science classes at SDSU were then turned loose with the boards, and asked to estimate the protein content of a large number of fresh samples, using the boards as guidelines.

This "field testing" ironed out some difficulties, and after some corrections were made, students were achieving a good degree of consistency when we compared their estimates with the true protein values. Some individual estimates were 1 or 2 but rarely 3% off, but when averaged in groups of 50 samples or more, the higher and lower estimates averaged out to be within a 1% protein range.

A protein board works this way: A representative sample of about one pint of wheat from the field or elevator bin is poured on the board. Then the board is shaken to distribute the wheat evenly.

Differences in the size of the kernels, their plumpness or extent of shriveling, presence and approximate percent of soft, starchy kernels, and intensity of the red color then become apparent. These characteristics can be compared to the standard representative samples already present under glass on the board.

The wheat farmer or country elevator operator who has a board can quickly determine the protein content of the field wheat in question. That gives the producer some grounds to insist on the protein premium which his wheat commands.

Then the country elevator operator can bin wheat of different protein contents separately. When it's sold, he can collect the protein premiums on all lots of wheat high in protein.

High protein kernels are hard, shriveled, and dark in color.

Here's what you'll see if your wheat is high in protein when you compare it to the boards.

Not-so-plump kernels. Plump, well filled kernels indicate medium to low protein wheat. High protein wheat always has slightly or moderately pinched kernels. Distinctly shrunken kernels are always high in protein. Badly shrunken kernels with a test weight of 54 pounds or less may have protein contents of 20 to 24%.

Fewer soft, starchy kernels. If there are no soft, starchy, lighter yellow spots in the kernels, the wheat has very high protein. Increasing amounts of soft, starchy kernels indicate lower protein. In general, a sample with 50% or more of soft, starchy kernels will seldom contain more than 13% protein.

Darker color. Assuming that weathering or bleaching hasn't masked the true color of the kernels, the darker the appearance of the sample, the higher the protein. Weathered samples may be medium to high in protein if they are somewhat pinched or shrunken; but plump, well rounded, bleached kernels will always be low in protein.

There is no direct relationship between protein content and test weight except when the test weight drops to around 54 pounds per bushel or less. Such wheat is generally not considered milling wheat.

There is one thing that board users should keep in mind. Extensive testing at SDSU has revealed that the lowest protein wheat samples (10 to 13%) were slightly overestimated and highest protein samples (16 to 18%) were slightly underestimated.

If you understand that, you can use the boards with confidence. They will help you get your protein premium. □

The weed and seed man

Raymond Kinch came back from retirement to explain his protein separation boards to our readers.

Ray retired this summer with honors. His most recent is the 1976 special "Award of Merit" at the 66th annual meeting of the Association of Official Seed Analysts, held at Hershey, Penn. This is the highest honor bestowed by the Association which covers both the U.S. and Canada. Only one individual is selected each year for such recognition.

The 1976 edition of "South Dakota Weeds" has been dedicated to Ray by the Weed Commission for his work on drill-box surveys and seed dormancy, and for his contributions to the seed industry. He was named professor emeritus by the S.D. Regents of Education this spring.

"We are pleased that Mr. Kinch has been recognized this past year both by his peers and by clientele groups in the state," noted Delwyn Dearborn, dean of the College of Agriculture and Biological Sciences at SDSU. "He has exhibited a very high professional commitment which has served as an example both to students and other staff members."

Ray was head of the Seed Testing Laboratory at SDSU. A native of Nebraska, he earned BS and MS degrees from the University of Nebraska, and worked there as a seed analyst for the Nebraska Department of Agriculture until he joined the SDSU staff in 1947 as an assistant professor of agronomy. In 1951 he was named associate professor and took charge of the Seed Testing Service. He was named full professor in 1958. □

Out there waiting for you

Most South Dakotans don't go out to a park even once a year for a picnic. And they probably wouldn't go if parks and other facilities were even closer to home and more convenient

A surprisingly under-used resource—the South Dakota outdoors.

A weekend camper far back in the line at a park check-in station on Saturday night might not believe that. Neither would a hunter buying shells the day before duck opening.

But that's the way it is. An unexpectedly small percentage of residents report that they participate in activities that imply use of state game and park resources.

There must be some reason. Is it because they are the wrong kind of outdoor experiences, that people would prefer doing something else? Or that they are too far from population centers?

Probably not. A survey by the Rural Sociology Department indicates that South Dakota people simply wouldn't get out and use outdoor recreation facilities even if they were **more** available and **more** accessible.

Over half of South Dakotans don't picnic, fish, or camp

The people concerned in this study were all persons on the personal property tax listings in South Dakota in 1973 and all Indian reservations. The computer selected 474 names off that list by random, for 0.25% of the total number of households in the state. Data were collected by trained interviewers from the heads of households or their spouses. (Only 16% of the samples were spouses, and we accepted these because other studies have shown close relationships between spouses in attitudes.)

We found that over two-thirds of the people we talked to hadn't been swimming, boating, water skiing, ice fishing, snowmobiling, or waterfowl hunting during the preceding year.

One-half or more of them hadn't even been picnicking, lakeside camping, or fishing during the same time. These activities did turn out to be the most popular outdoor pastimes of those we interviewed. They are family oriented activities; most of the people who packed up the food and the fishpoles tended to be married couples with children living at home, those between 15-59 years of age, and people with higher income levels and more formal education.

So this dispels the myth most of us hold—that a person can always go on a picnic, even if he doesn't have the price of a baseball game ticket.

Upper-income people tend to use outdoor facilities more

Yet the opportunity is there. South Dakota has many park and lake areas in the more densely populated areas of the state. This means that to picnic or camp a person wouldn't have to make a large investment in time or expense. People of all income and all educational levels **could** picnic or camp.

Nevertheless, they segregate out—more persons in the middle and upper socioeconomic levels are more likely to participate in lakeside camping or picnicking.

Neither do elderly people, with more time to spend on recreation, make much use of the outdoors. Granted, we wouldn't expect them to be avid snowmobilers, but our survey found people over 60 don't participate in any outdoor recreational activity to any great extent. That includes picnicking and fishing, the quieter sports.

Already displaced from the mainstream of social and political contacts, older people do not take full advantage of the recreational opportunities awaiting them outdoors. Perhaps we need to reexamine the needs of the aged and the poor and start programs to increase their outdoor enjoyment.

In one summary statement, we can say that participation in most recreational activities increases as income increases. The argument that individuals in lower socioeconomic levels would use

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Few picnic or lakeside camp. Even fewer, less than a third, of the total population, swim, boat, snowmobile, or hunt waterfowl in a year's time. This doesn't say that parks aren't crowded on summer weekends. But it does mean that South Dakotans are under-using the South Dakota outdoors year round.

recreational facilities more if the facilities were more available and inexpensive was not supported.

City folks spend more time at parks than do country people

Hunting and fishing predominantly attract males, especially younger men. If they live on farms, they are most likely to hunt game birds and small game. Persons who live in a multiple dwelling in a city will be the next most likely to hunt these species, followed by persons living in a single dwelling in a city less than 2,500.

Usually hunters and fishermen regularly read conservation or outdoor sports magazines, have had military experiences, and have taken a firearms safety course.

Since boating, water skiing, and snowmobiling require a much larger investment in equipment than the other activities studied, it wasn't surprising to find that people in the higher socioeconomic levels participated more in these activities. They also tended to be young and have children living at home.

People that live in the country are not enjoying outdoor sports exclusively. In fact, residents of urban areas are more likely to engage in all types of outdoor recreation than residents of rural areas. So once again, the "opportunity approach" (that the person who has the best opportunity to do something will be the first to take advantage of it) could not be supported by our study.

This has implications for future policy decisions

A large segment of South Dakotans isn't getting outdoors. Granted, not all outdoor activities appeal to all people, because of the nature of the sport or the investment involved.

However, there are other activities that should have wide appeal. They are resources that are going to waste. South Dakotans apparently need greater education and encouragement to enjoy these activities.

And for the state, there would be greater revenue if more people participated. Only a small percentage of women, for example, hunt and fish. The remainder represents a large, untapped source of revenue through the sale of licenses and fees.

There will be new and changing demands for outdoor recreational activities. Populations are shifting, from town to country and back again. Technology is giving us more free time. Adolescents are staying in the family longer.

By the year 2000 the demand in the nation for almost all types of recreational activity is expected to double, and the number of participants to increase from 4.4 billion in 1960 to approximately 12.1 billion.

Outdoor recreation is a major industry in South Dakota, but up to now there hasn't been much information about the kind of people who participate in such activities. This kind of base is needed before future policy decisions can be made. □

Why some manpower programs fail

American Indians drop out of a training program faster if it is held in a classroom instead of on the job, shows one of first studies on such subjects in South Dakota.

When you're poor and need a better paying job, you have two options. You can go to school, learn your skills, and then you can look for a job. Or an employer can give you the job, and let you learn the skills while you're drawing a paycheck.

In the case of South Dakota Indians, the on-the-job training appears to have a slight edge. We suspect the reason is rooted in the Indian cultural background.

Both types of programs are available to Indians and to other disadvantaged people. Of the many federally sponsored programs in the state, we chose to examine two which have these different approaches to helping people obtain reasonable, full-time employment.

JOBS is full-time work; MDTA is classroom studies

The JOBS program (Job Opportunities in the Business Sector) places the participant in a full-time job. This work experience is nearly his entire training. The employer, who must be in the private sector of business, is reimbursed by the federal government for part of the trainee's wages, and is expected to keep him on at the end of the training period. In the years between 1968 and 1972, 70% of the participants who entered the program completed it.

The MDTA program (Manpower Development and Training Act) is classroom oriented and includes basic education along with vocational skills. Training is usually conducted in state supported vocational schools. MDTA students receive a basic living allowance, but no salary as such.

The sample of participants (1970-71) in both MDTA (202 participants) and JOBS (157 participants) included a large proportion of "disadvantaged" persons. The criteria for being classified as disadvantaged, according to the requirements of the legislation underlying these programs, are: (1) persons not suitably employed, (2) either a high school dropout, under 22 or over 45 years of age, handicapped, or subject to special obstacles to employment, and (3) from a family that receives welfare payments or which is below poverty income levels. (For a family of four, poverty class tops at a $4,000 income for non-farmers, at $3,400 for farmers.)

In the MDTA program, 88% of the participants were considered disadvantaged; 56% of these and 88% in the "advantaged" group completed the program.

JOBS trainees included 89% in the disadvantaged category, 56% of whom finished the program. Only 1 out of 17 advantaged trainees failed to finish.

Dropouts had common traits, traceable to Indian culture

We wanted to know if there were any common characteristics that were shared by those failing to complete either program. There are, but the findings are more clear-cut from the MDTA (the classroom atmosphere) program.

Race and sex, either singly or in combination, made a difference in training outcomes for the MDTA program. White females had the highest rate of completion, Indian males had the lowest. The majority of the Indians, both males and females, are not completing the MDTA program, suggesting the particular importance of racial and cultural factors in an institutional type program.

Dropping out of a program is not always an admission of failure, of course. The participant may have found a better opportunity on his own, or events not directly related to the program may have resulted in failure to complete the program.

The formal education a participant had before coming into the program was also significantly related to completion. The more years of school one had, the more likely a person was to complete the MDTA program.

Length of previous employment also made a difference. Those trainees with highest completion rates had no previous unemployment on their records. If they had been out of work before beginning the program, the percentage going on to finish increased as the number of weeks of previous unemployment increased.

It was different in the JOBS program. Percentage of completion dropped as length of previous unemployment increased, excepting the extremes—fully employed and out of work for over a year.

In the MDTA program the person least likely to complete training was an Indian male with 7-9 years of formal education, considered disadvantaged, and who had been unemployed 1-25 weeks in the past year. We couldn't draw as clear a picture from the JOBS program.

These people were not expected to fit neatly into categories. People are directed by their own private motives, and also influenced by the culture in which they grow up.

It would appear that the Indian culture has a significant effect upon Indians in such educational programs as MDTA and JOBS. The importance of the family unit and kinship ties among Indians, the security provided through these ties, and the reciprocal obligations involved are cultural aspects which work against geographic mobility in job seeking or placement. We know that American Indians do not place the value on formal education—or the work ethic—that whites do. How much of this is because of culture and how much is due to poverty is a point sociologists may debate for decades.

Some maintain that there is a "culture of poverty," a particular subculture that reaches over national and regional boundaries. It includes some of the poor who are living in class-structured, highly individualistic, capitalistic societies.

By **J. W. DeLong**, former research assistant on SDAES project 621, **R. M. Dimit**, principal investigator, Department of Rural Sociology

Some sociologists say that the culture of poverty is an adaptation and reaction of these people to their marginal position in such a society, an effort to cope with feelings of hopelessness and despair.

Wherever this subculture occurs, these sociologists point out, there are similarities in family structures, interpersonal relationships, spending habits, and value systems. The culture tends to perpetuate itself. It is characterized by chronic unemployment or underemployment, low income, and lack of property. These cultural patterns can't be easily changed by simply providing employment, training, or guidance.

Merely providing job training is only the beginning

Our interest in a special group or subculture among the poor, both Indians and whites, centers on the effect it has on career mobility. Follow-up studies on these particular trainees might explain the relationship between culture and individuality, and their influence on a person's ability to move around in the job market.

We can say, however, that American Indians will drop out of a program faster if it is classroom oriented. Perhaps they have had more experiences with failure in the formal educational situation and consequently anticipate failure again when returning to a classroom. Of course, the wages paid in the JOBS program provide immediate rewards and incentives.

This is one of the first studies to be conducted on federally sponsored educational and training services in the state. Considerable attention has been given to the needs of minority groups such as the Negroes and Spanish Americans in urban settings, but little to the American Indians as a minority group, and especially to those living in rural areas and on reservations located in rural areas.

Unemployment runs as high as 80% on some reservations, and the majority of those who are employed are working in semi-skilled or unskilled occupations.

Merely providing the training and education to attain better jobs is not enough. There must be jobs available after the training is completed, and these must be in locations where the person desires to live. Our training programs must meet the needs of the participants if they are to be successful. Understanding why some education programs work and others fail is one way to approach the problem. □

Publications Off the Press

The Agricultural Experiment Station and the Cooperative Extension Service distribute a large variety of publications to South Dakota citizens. Your county Extension office will have copies for you. These publications list the new subjects between May 1 and August 1, 1976.

FS 647 Sucking Insects and Gall Formers on Trees and Shrubs
FS 648 Leaf Chewing Insects on Trees and Shrubs
FS 649 Insects Attacking Stems, Branches and Trunks of Trees and Shrubs
FS 650 Raising Pheasant Chicks
FS 651 Program Determination
FS 654 Shaping Hedges

EC 712 Wheat Transportation in Perspective
EC 714 So You Want to Live in the Country

EMC 697 General Tree Establishment Procedures
EMC 698 Planting Bare Root Trees
EMC 699 Planting Containerized or Potted Trees
EMC 700 Planting Balled and Burlapped Trees
EMC 703 Lignasan BLP Fungicide as An Aid to Control Dutch Elm Disease

ECC 19C Extension Quarterly - Six Men Who Irrigate

AES 14 Plant Science Research at Highmore

Progress Reports Eastern South Dakota (series of 7)

B 640 Sourdough Sampler
B 641 Snowmobile Innovations

B 643 Lime Applications Seldom Benefit South Dakota Soils

TB 43 The Eriophyoidea of South Dakota

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