

THE FOOD AND HEALTH HABITS OF 30 INDIAN
FAMILIES LIVING AT MORTON, MINNESOTA

by

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INTRODUCTION

A belief that a home economics teacher should have a knowledge of the background of the people with whom she works prompted the investigator, a home economics instructor at the Pipestone Indian School, Pipestone, Minnesota, to study the living conditions of a group of Indians whose children attended that school. It was desired to study the food habits and home living conditions of an Indian settlement regarded as more than usually progressive and to determine, in so far as possible, the adequacy of the diets. The chosen group of Indians was one of three settlements under the jurisdiction of the Pipestone Indian School, the Mdewakanton band of Dakota Sioux at the Birch Coulee settlement near Morton, Minnesota.

Following the massacre of 1862, most of these Indians were moved to South Dakota. A few, friendly to the whites, living at the Birch Coulee settlement were left behind. At the time of this survey of June 1, 1938, the community was composed of 30 families, which included 145 residents, 63 of whom were under 18 years of age.

These people resided upon small tracts of government land, 10 to 20 acres in size, assigned to the head of the family to be used for the exclusive benefit of the

assignee. This land was purchased for the Mdewakanton Sioux by the government from funds appropriated for the most part under the acts of March 3, 1889 and March 21, 1889.

On June 11, 1936, the constitution of the Lower Sioux Community located in Redwood County, Minnesota, was approved. During this year, \$12,900.00 were allotted for rehabilitation purposes. It was the intention to secure additional land in order that each family might eventually have from 40 to 80 acres to establish a farm home. At the time of the study, some of the land was under option for purchase by the government.

The community was centered around St. Cornelia's chapel, with its homes for a missionary and a minister, an agency house, the grade school for the Indian children, and the new community house dedicated June 1, 1938.

REVIEW OF LITERATURE

The aborigines, before the time of Columbus, are believed to have had great physical endurance and to have been relatively free from disease; then the Indian lived to a "ripe old age". Today his life is menaced with all the health problems of the white men with the addition of a greater susceptibility to certain diseases and the difficulties that arise from changing cultural patterns.

Wissler (17) believed that Coronado described the typical Plains Indian when he wrote, "These people eat raw flesh and drink blood. They do not eat human flesh. They are a kind people and not cruel. They dry flesh in the sun, cutting it thin like a leaf, and when dry they grind it like meal to keep it and make a soup to eat. A handful thrown into a pot swells up so as to increase very much. They season it with fat, which they try to secure when they kill a cow. From what was learned of these Indians, all their human needs are supplied by these cows for they are fed, clothed, and shod from these."

In 1852 when Colonel Brackett (2) visited Red Wing and St. Paul, Minnesota, he saw Sioux Indians able to endure great fatigue though unequal to the whites in stature. Here, he ate fish that a squaw cooked over a fire in the

center of a lodge in which were compartments with buffalo robes for beds. He described the cooking as "filthy and wretched", a condition he could never forget. People ate whenever they desired with no set time for meals. A plentiful supply of meat was preserved for winter. Buffalo and deer meat were the principal foods in the Indian homes but at the agencies, beef, corn, and flour were used. These Indians had a great liking for tobacco, coffee, and sugar.

Gardner (7) reported that when food was to be cooked the Red River Valley Indians stretched the skin of a recently killed animal over a hole in the ground. This skin was filled with water and into it they put heated stones and the food they wished to cook. He was amazed at the variety of foods which were combined, stewed to a paste in this fashion, and then consumed in unbelievably large quantities. These Sisseton people lived chiefly by hunting and fishing until 1861 at which time the government furnished corn and potatoes for seed and cultivation of the soil was begun. Gardner found half-bloods living like Indians amid much "dirt and vermin", yet healthy, strong, and leading vigorous and "laborious" lives. Venereal diseases were rarely noted.

The nomads manufactured no pottery, according to Doyle (5) and even in 1876 when pots and kettles were a-

available, the Indian rarely boiled meat. He existed for the most part on meat broiled in some fashion or on dried meat which required no cooking.

Beckwith (1) described pemmican, wild turnips, and various bulbous, esculent roots which the Indians collected and dried for winter use. Dried turnips were an important item of the Dakota Indian menu. In case of necessity, though considered too delicate for ordinary consumption, dog was eaten. All birds, excepting the eagle and turkey, all beasts, and all water plants and animals were used for food. Beckwith also mentioned the huge stomach capacity of the Indian whom, in event of shortage of food, would "tighten his belt to prevent a vacuum and then go on his way uncomplaining."

In spite of wars, famines, and epidemics of early times, the birth rate of the Dakota Indians had exceeded the death rate until they changed their mode of living, according to Riggs (14). He believed that the acceptance of the habits and environments of civilization would bring a death wave because the Indian was ignorant of living under these new conditions. True to Riggs' prediction, the death rate did increase; the Dakotas cried, "We die, we all die, we are consumed with dying."

Also studying the Dakota customs, Mirsky (11) found that in the early days these Indians had no agriculture

so supplemented their meat diet with wild fruits and vegetables. Meat was "jerked" and dried to be made into pemmican by the women to provide a food that could be carried on their travels. With such limited methods of food preservation these people were often faced with starvation.

The Mdewakanton band, with agency headquarters at Redwood Falls, Minnesota, consisted of 900 Dakotas distributed among the communities of Mendota, Shakopee, Eggleston, and Morton, Minnesota. Grinnell (8) studying these people in 1900 found they were sober, industrious, and practically self-supporting, although receiving government annuities in money.

On many reservations, according to Grinnell (8), talk consisted largely of the "good old times" and of "issue day" with complaints of hunger because of unfair distribution of food, too little food, or failure to reach the issue house before the supply was depleted. The author described reservation life as difficult--"The confinement, the monotony, the sickness, the insufficient food, and the general hopelessness of it all make life on the reservation dreary enough, for in most cases people have not reached a point where they have anything to look forward to." About this time, notice was taken of the failing health of

the Indian who seemed to show a predisposition to diseases of the throat and lungs. The Plains Indian suffered severely from pulmonary tuberculosis which apparently caused nearly one-half of the tribal deaths. Some physicians believed Indians rarely died of other diseases. Scrofula with open sores began to show itself. The mode of living favored this disease as the wandering Indian became sedentary and gave up his tepee for a poorly ventilated, dirty, one-room cabin, with no knowledge of how to live in a house, how to cook the foods of the white men, or how to use his leisure time.

"No reference to the prevalence of this disease (tuberculosis) among the Indians is made by writers who reported on the period of the earliest contact of the whites with various tribes," said Hrdlička (9) in his report of 1909 at which time tuberculosis caused 7.9 deaths per 1,000 Indian population as compared with 1.7 for the white and 4.0 for the Negro. He found indications of tubercular infection in at least two-thirds of 100 Oglala Sioux families.

A survey made by the U. S. Public Health Service (4) in 1912 showed tuberculosis and trachoma prevalent and intimately associated with the social and sanitary conditions of the Indians. Trachoma infected 22.7 per cent of the 39,231 Indians examined, being higher among the full-

bloods than the mixed bloods whose living conditions more nearly approached that of their white neighbors. The severity of the long winters caused the Indian to remain indoors in his crowded living quarters which provided favorable conditions for dissemination of tuberculosis for which the death rate at this time was 11 in 1000 population.

Even though the Indians had been restricted to the reservation since the middle of the 19th century, they had learned too little of the practical application of the principles of hygiene. Their way of living seemed to play a large part in the perpetuation of diseases. The more primitive the Indian, the poorer the construction of the houses and the more unsanitary they were.

According to the figures of the Office of Indian Affairs (3), while 17,188 Indian families were living in houses with permanent floors, 9,200 still lived in houses with dirt floors, and 9,582 in tents and tepees. The homes typical of the North and Northwest Indians consisted usually of a log cabin or a small one-story frame dwelling with a common room for cooking, sleeping, and entertaining the many visitors. Windows were small and frequently nailed shut.

In the winter the tendency was to huddle into one room leaving the rest of the house vacant although in the

summer, the Indian desired to live in a tent or brush shelter. While the average family consisted of four or five individuals, eight or ten people often lived in one small dwelling. It seemed there was little cleaning and removal of refuse. Although some homes were furnished with articles necessary for any fairly well-equipped room, others might contain only a few rags and a simple stove. Bed linen was lacking; some Indians slept on the floor. If towels were used, they were common to all the family members.

According to the survey by the Public Health Service of 1912 (4), the Indian, naturally robust, was at this time undernourished as a result of surfeit when food was abundant followed by starvation when food was scarce. He provided little for future needs and that tended to disappear as it was put at the disposal of the many friends who took advantage of his hospitality. His food was of poor quality as well as poorly prepared, consisting often only of coffee, fried bread, and whatever else was available. It was believed the inadequate diets and the use of alcohol lowered the Indian's resistance to disease. No evidence was found of extensive prevalence of venereal diseases. Impetigo contagiosa and scabies were the most common skin diseases. Indifference, with expectation of return to health, deferred the Indian from seeking medical

aid.

Eastman, (6) a native of Redwood Falls, Minnesota, gave a sad picture of his race, the population of which had rapidly declined after 1840 until the Indian death rate at the time of his writing, was twice that of the white American. He reported 70,000 Indians in the United States suffering from trachoma and 30,000 with tuberculosis from which three times as many Indians died as whites. He believed, however, the "lowest point of decline" had been reached and that the race was slowly recovering. Causes for decline he thought to be the Indian's ignorance of civilized ways, the poor sanitation of his stationary home, the abrupt changes in his mode of living, and the indigestible food which was poor in itself and poorly prepared. The Sioux of this period made sugar from the box elder, birch, and ash which was often used in medicine. Here again mention was made of pemmican and the large quantities of strong coffee consumed. To quote Eastman, "He (the Indian) lived a squalid life, unclean and apathetic physically, mentally, and spiritually."

Salomon (15) tells us that the Indian used a variety of foods as well as many methods of preparing them. He believed ingenuity was shown in the serving of available foods and that from the red man have been inherited some popular dishes the recipes for which the author had

collected. The pit-oven, hot-stones, roasting, and broiling were mentioned as methods of cooking food. Corn was used in a variety of ways; many roots were eaten as vegetables while some were made into flour. Squash or pumpkin, maple sugar, wild fruits, nuts, seeds, pemmican, and beverages made from roots, leaves, and twigs were listed by this author as favorite foods of the Plains tribes.

The more recent study of 67 Sioux families at the Crow Creek Reservation made by Stene and Roberts (16) gave a picture of a group of Indians of 10 years ago. These workers suggested dietary deficiencies as a cause of physical deterioration. For example, the little calcium in the diets may have been associated with poor teeth and bow legs that were noted and lack of vitamin A might be related to the frequency of occurrence of night blindness, tuberculosis, and other infectious diseases. The diet was indicated as a factor in 85 per cent of the deaths from known causes. The families of one-third of the 164 dead children lived chiefly on bread and coffee. These investigators concluded poor sanitation and inadequate diets were largely responsible for the physical status of these Indians.

In summarizing the food habits of the Chippewa families of Northern Minnesota, Netz (13) said little milk was used and that in the form of canned milk in tea and coffee or on

cereals. The fat of salt pork and bacon as well as lard was used for frying, seasoning, and as a spread for bread. Butter was considered a luxury. White flour was used in quantities; yeast bread and "fried bread" occurred frequently in the diets. Very little farming was done although some families had gardens where navy beans, onions, carrots, squash, cabbage, pumpkin, and cucumbers were raised most frequently. Wild game, fruits, rice, and fish were the chief sources of subsistence as much land was unproductive. Eggs were seldom used but sweets, tea, and coffee appeared often. Cakes, pies, and cookies were usually purchased if they were to be had. When the budget allowed, boiling beef, salmon, prunes, raisins, bananas, oranges, and grapes were purchased. Netz believed the choice of food and the educational work done by schools and nurses were related to the general health of these Indians.

Observations on the Indian health problems by Mountin and Townsend (12) of the Public Health Service in 1936 gave evidence that tuberculosis, trachoma, intestinal disorders of infancy, skin diseases (ringworm and inpetigo), and gum disorders were common problems. Venereal diseases were prevalent in certain groups. In most tribes these workers found an unbalanced and deficient diet, often low in

quantity, with milk and fresh vegetables seldom used. Carbohydrates, fats, and meats, causing overweight adults and malnourished children, were used excessively by some tribes.

As diagnosis of deficiency diseases in the mild stage was difficult, it was uncertain what part the diet really played in the health of these people. These authorities (12) attributed the slow progress to environment--such as overcrowded homes, poor water supply for drinking and limited for cleaning purposes, physical surroundings, and methods of excreta disposal. Economic conditions and the Indian's failure to understand the principles of bacteriology were other problems.

Klein and Palmer (10) of the United States Public Health Service indicated in 1937 that dental caries in the permanent teeth of the American Indian children were more severe in the Northwest (Alaska) than in the Southwest, with Plains Indians midway between. Of those sixteen years of age or over in the Plains area, 88 per cent had defective permanent teeth. A detailed record of the food eaten in these areas was made in connection with this survey.

In the 1937 report from the Office of Indian Affairs, Collier (3) said, "That Indian health has been improved in

recent years is borne out by figures showing the decline in death rate between 1933 and 1936. The Indian death rate in 1936 was 13.7 per 1000 or 2.2 more per 1000 than among whites (including Negroes). Only as recently as the 1920's the Indian death rate was double that of the general population. The Indian death rate is still too high".

PROCEDURE

The purpose of this investigation was to study the diets and living conditions as well as to observe the physical status of 30 Indian families living at the Birch Coulee settlement near Morton, Minnesota.

At the beginning of the investigation, a trip was made to Pipestone, Minnesota, agency headquarters, to obtain information concerning the Morton Indian Reservation, 107 miles distant. The annual narrative report for the fiscal year of 1937 for the Mdewakanton Sioux of the Pipestone jurisdiction was read, the rehabilitation project studied, and a list of voters secured to aid in making a register of family names. To prepare the way for the investigator, the superintendent of the Pipestone Indian School and its jurisdiction sent a circular letter in advance to each family telling them that a representative of the Pipestone Indian School was to visit them in their

Key for form A

Family Record

abs. - absent	t. - thin
act. - active	tuberculosis
da. - daily	1. No record
em. - emaciated	2. Negative Mantoux
ex. - excellent	3. Positive Mantoux
f. - fair	4. Healed primary pulmonary
F. - female	tuberculosis
g. - good	5. Healed cervical lymphadenitis
lat. - latent	6. Negative sputum
M. - male	7. Negative X-ray
med. - medium	v.p. - very poor
nts. - nights	venereal diseases
n. - no, none	K. and W. - Kolmer-Wassermann
occ. - occasionally	G. C. - gonococcus infection
pl. - plump	N. R. - no record
p. - poor	+ - positive
sc. - scars	- - negative

¹Tribe and degree to be indicated with initial of tribe with fraction of blood - e. g. S 4/4 meaning Sioux, full-blood.

A. FAMILY RECORD

Name:	Under 1 yr.		1 to 6 years		7 to 17 years		18 to 60 years		Over 60 years	
	M	F	M	F	Male	Female	Male	Female	M	F
Date:										
Location:										
Tribe and degree Education: amount Appearance: fat, pl. med., t., em. Teeth: ex., g., f., p., v.p. Trachoma: abs., act., healed, n. r. Tuberculosis: 1. 2. 3. 4. 5. 6. 7. Rickets: act., sc., n. Skin diseases: evident with clothing on: yes, no Venereal diseases: K & W, K.G.C., n.r.										
Medical record										
No. dead in immediate family.										
Cause of death										
Wash teeth: da., occ., never										
To bed at										
Up at										
Hours nap										
Total										
Windows open nights: yes, no										
Sleep outside: yes, no										
Total no. in each sex group										
Total no. in each age group										
Total no. in family										
Notes:										

Notes:

Key for form B

Finances

Ave. - average

can - canned

dr. - dried

n. - none, no

per. - percentage

r.c. - root cellar

T. - total

y. - yes

Key for form C

Housing

Ave. - average
D. table - dining table
cl. - cloth
gl. - glass
n. - no
op. - opening
part. - partially
Per. - percentage
T. - total
y. - yes

C. HOUSING

Family number	House					Equipment		Food storage		Condition		
	Kind	Rooms	Floors	Windows	Sleeping rooms	Cook stove	D. table					
	Frame Tent Other	1-2 3-5 6 or more	Dirt Wood Other	Kind: gl, cl, op. Number per room Screens: yes, no	Number beds Number sleeping in beds Number sleeping on floor	Outdoor Coal or wood Kerosene	Present: yes, no Adequate: yes, no	Kitchen Hole in ground Cave Well Basement	New: yes, no Rehabilitated: yes, no, part. Needs repair: yes, no Kitchen: yes, no			
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
T.												
Ave												
Per												

Notes:

Key for form D

Sanitation

Ave. - average

b. - wash basin

n. - no

Per. - percentage

t. - washtub

T. - total

y. - yes

Key for form E

Infant Record

act. - active

Ave. - average

da. - daily

em. - emaciated

ex. - excellent

f. - fair

F. - female

g. - good

M. - male

med. - medium

n. - no, none

Per. - percentage

pl. - plump

p. - poor

t. - thin

T. - total

v.p. - very poor

wt. - weight

wk. - weekly

y. - yes

Key for form F

Diet

al.	- always	m.	- at meal
a.s.	- as such	n.	- no
Ave.	- average	nev.	- never
b.	- between meals	occ.	- occasionally
bkft.	- breakfast	past.	- pasteurized
ca.	- canned	Per.	- percentage
cook.	- cooking	r.	- raw
3 da.	- three times daily	r. to e.	- ready-to-eat
2 da.	- twice daily	T.	- total
1 da.	- once daily	usu.	- usually
fin.	- finicky	wh.	- white
freq	- frequently	wk.	- week
fr.	- fried	w.w.	- whole wheat
h.c.	- home cooked	y.	- yes
lbs.	- pounds	yt.	- yeast

¹Indian "fried bread" is a bread similar to biscuit dough which is fried in fat.

F. DIET

Family number Like: yes, no Daily amount Form: r. past. can. Tomatoes Green Yellow Raw Potatoes Citrus Dried Bananas Apples Beef Pork Fish Note	Foods											
	Milk	Veg. servings per wk.	Fruit servings per wk.	Meat servings per week	Eggs	Bread	Cereals	Amt. fat per week	Can-dy	Bever-ages	Eating habits	
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
T.												
Ave												
Per												

Foods

Notes:

Cooking method most used for meat
No. doz. last week
Use: for cooking, as such
Kind: w.w., white
Type: fried, yeast
No. loaves last week
Flour: lbs. per week
Bkft: yes, no
Kinds: r. to e., h.c.
Rice: amt. last mo.
Macaroni: amt. last mo.
Other

Butter
Lard
Other
Eaten: freq. occ. nev.
Eaten: at meals, between meals
Coffee: 3 da., 2 da., 1 da.
Tea: da., occ. nev.
Other: da., occ. nev.
Appetite: g., f., p., fin.
Bkft: al., usu., occ. nev.
No. meals per day
Between meals: yes, no
Kind of food eaten between meals

Key for form G
Diet Rating Record

ad.	- adult	no.	- number
al.	- always	occ.	- occasionally
amt.	- amount	Per.	- percentage
Ave.	- average	pts.	- pints
bet.	- between	qts.	- quarts
bkft.	- breakfast	suit.	- suitable
cit.	- citrus	toma.	- tomatoes
ch.	- child	T.	- total
da.	- daily	usu.	- usually
med.	- medium	veg.	- vegetables
nev.	- never	W.	- whole
n.	- no	wk.	- week
		y.	- yes

manner of living. The dedication of the new community house on June 1, 1938, offered a picture of the past and present conditions as well as predictions for the future, as definite plans were presented for material and social progress. This helped in understanding and evaluating certain standards of living that existed at the time of the study.

The Indian families were most cordial in receiving the investigator and the desired information was obtained from them with little difficulty and delay. After the supplementary material was collected at Morton and Redwood Falls, a return trip was made to Pipestone where federal employees and government records were again consulted. The Pipestone Indian School hospital furnished some additional medical records.

The data were then tabulated, evaluated, and interpreted in terms of the adequacy of the diets and desirability of eating habits. The diets were rated as A, B, C, D, and E as indicated in table 1. The milk intake, the daily food intake other than milk, and the eating habits were each given separate scores. From the average of these the final rating for the diets was obtained.

Table 1. Dietary standards.

Specifications for adequacy of diet				
A	B	C	D	E
Child 1 qt. milk Adult 1 pt. milk	Child $1\frac{1}{2}$ pts. milk Adult $\frac{3}{4}$ pt. milk	Child 1 pt. milk Adult $\frac{1}{2}$ pt. milk	Child 1 c. milk Adult $\frac{1}{2}$ c. milk	Child less than D Adult
10 food requirements ¹	9 food requirements ¹	7 to 8 food requirements ¹	6 food requirements ¹	5 or less food requirements ¹
6 desirable eating habits ²	5 desirable eating habits ²	4 desirable eating habits ²	3 desirable eating habits ²	2 or less desirable eating habits ²

¹Daily food requirements other than milk

1. One green vegetable
2. One yellow vegetable
3. One raw vegetable
4. One potato
5. One tomato or citrus fruit
6. One other fruit
7. One whole grain cereal
8. One meat
9. $\frac{1}{2}$ oz. butter
10. $\frac{1}{2}$ egg

²Eating habits

1. Minimum amount of candy, eaten at close of meal
2. Breakfast daily
3. Three meals per day
4. Minimum amount of coffee and tea
5. Desirable foods eaten between meals
6. Desirable environment for eating

RESULTS AND DISCUSSION

Of the 145 members comprising the 30 Indian homes of the Birch Coulee settlement, 6.2 per cent belonged to other races. These were Mexicans, Scandinavians, and Germans who were married to Indians. Only 23.4 per cent of these tribal members reported themselves as being full blood Indians, with a slightly larger number falling in the three-quarter blood group as shown in table 2. The Indian blood of the remainder ranged from one-eighth to seven-eighths. It may be noted that more men than women of other races intermarried with the Indian.

The families consisted of 81 males and 64 females. The largest male group came in the 18 to 60 age-division, which meant there were 18 men of this age who were single, divorced, or whose wives were dead, compared with 5 women in this same group. For all of these men to marry would necessitate finding some of the wives off the reservation.

Of the family members, 58.3 per cent had completed the eighth grade in school while 4.9 per cent had never been to school (table 3). A greater proportion of women than men had gone beyond the eighth grade, at which time the men were inclined to regard their formal education as finished.

Table 2. Degree of Indian blood of the 145 tribal members.

Degree of Indian blood	Age-group										Total	
	Under 1 yr.		1-6 yrs.		7-17 yrs.		18-60 yrs.		Over 60 yrs.		Number	Per cent
	Male	Fe- male	Male	Fe- male	Male	Fe- male	Male	Fe- male	Male	Fe- male		
4/4	0	0	3	1	3	6	5	8	4	4	34	23.4
7/8	0	0	0	0	0	0	0	2	0	0	2	1.4
3/4	1	0	3	0	2	3	18	10	1	1	39	26.9
5/8	0	0	2	0	3	1	2	0	0	1	9	6.2
1/2	0	0	2	2	1	2	5	2	2	2	18	12.4
7/16	0	0	1	2	3	2	1	1	0	0	10	6.9
3/8	1	0	1	3	1	2	0	0	0	0	8	5.5
1/4	0	1	0	0	3	3	1	1	0	0	9	6.2
1/8	0	0	2	0	3	0	0	2	0	0	7	4.8
0	0	0	0	0	0	0	7	1	0	1	9	6.2
Total in sex group	2	1	14	8	19	19	39	27	7	9	145	100
Total in age group	3		22		38		66		16		145	

Table 3. Amount of education of the older members of the 30 Indian families.

School grade completed	Indians				Other races married to Indians		Total	
	18 to 60 years Male	18 to 60 years Female	Over 60 years Male	Over 60 years Female	Over 18 years Male	Over 18 years Female	Number	Per cent
0	0	1	1	1	1	0	4	4.9
1	1	0	0	0	0	0	1	1.2
2	0	0	0	1	0	0	1	1.2
3	1	2	0	1	1	0	5	6.1
4	0	3	2	0	1	0	6	7.3
5	2	1	1	3	1	0	8	9.6
6	1	1	1	0	0	1	4	4.9
7	2	2	0	0	1	0	5	6.1
8	15	6	0	0	0	0	21	25.6
9	4	3	0	0	0	0	7	8.5
10	2	2	0	1	0	0	5	6.1
11	0	1	0	0	0	0	1	1.2
12	2	4	0	0	1	1	8	9.6
Over 12	1	0	0	0	0	0	1	1.2
Unknown	2	0	1	1	1	0	5	6.1
Total	33	26	6	8	7	2	82	100

Health

It was noted that 9 of 11 individuals characterized as "fat" were between the ages of 18 to 60 years; seven of these nine were females (table 4). Of the 145, 71.7 per cent were classified as being of a medium degree of fatness. Out of 63 under 18 years of age, only nine appeared to be fat while four were plump.

There has been a general belief that the aborigines had excellent teeth but that the acceptance of the food and health habits of the white man brought dental trouble to the Indian. In the records available in 1937 more women than men were edentulate, the number totaling nine (table 5). Those who sponsored the general health clinic held in June, 1937, were pleased with the dental conditions, especially among the children, 55 per cent of whom attended the clinic. The 8.6 per cent classified as having very poor teeth all fell within the adult group. Dr. Stitt¹, field dentist in the Indian Service, stated that dental conditions were good in 1937 when he last visited this reservation.

The summarized data concerning these diseases at this

¹Correspondence with Dr. David D. Stitt, Field Dentist, Indian Service, Office of Indian Affairs, Washington, D. C. March 21, 1938.

Table 4. Degree of fatness of the 145 tribal members.

Degree of fatness	Age-group										Individuals	
	Under 1 yr.		1-6 yrs.		7-17 yrs.		18-60 yrs.		Over 60 yrs.		Number	Per cent
	Male	Fe-male	Male	Fe-male	Male	Fe-male	Male	Fe-male	Male	Fe-male		
Fat	0	0	0	0	0	1	2	7	1	0	11	7.6
Plump	0	0	1	1	1	1	2	1	2	1	10	6.9
Medium	1	2	13	7	16	13	29	14	3	6	104	71.7
Thin	0	0	0	0	2	4	5	3	1	1	16	11.0
Emaciated	0	0	0	0	0	0	1	2	0	1	4	2.8
Total	1	2	14	8	19	19	39	27	7	9	145	100

Table 5. Teeth conditions of tribal members over one year of age.

Condition of teeth	Age-group								Individuals	
	1-6 yrs.		7-17 yrs.		18-60 yrs.		Over 60 yrs.		Number	Per cent ¹
	Male	Fe- male	Male	Fe- male	Male	Fe- male	Male	Fe- male		
Excellent		2	1	4	2	1			10	14.3
Good		1	3	2	7	7			20	28.6
Fair	5	1	6	5	2	1			20	28.6
Poor				3				2	5	7.2
Very poor					2	2		2	6	8.6
Edentulous						1		2	6	12.9
No record	9	4	9	5	26	15	3	1	72	
Total in sex group	14	8	19	19	39	27	7	9	142	
Total in age group	22		38		66		16		142	

¹Calculated on those examined.

settlement showed disagreement with the common opinion that tuberculosis, trachoma, and venereal diseases are prevalent among the Indians (tables 6, 7, 8).

Table 6. Medical record of tuberculosis.

Test	Individuals			Per Cent
	Negative	Positive	Total	
Subjects with tests recorded	:	:	:	:
Mantoux	51	19	82	56.5
Healed cervical adenitis	:	1	:	:
Healed primary pulmonary	:	7	:	:
Sputum	1	:	:	:
X-ray	3	:	:	:
Subjects with no tests recorded	:	:	:	:
Per cent	67.1	32.9	63	43.4

Table 7. Record of trachoma.

Status	Individuals	
	Number	Per cent ¹
Absent	74	96.1
Evidence of healed	3	3.9
Active	0	:
No record	68	:

¹Calculated on number examined.

Table 8. Medical record of venereal diseases.

Disease	Positive	Negative	No record
Syphilis			
Kolmer-Wasserman	1 (4+) ¹	77	67
Kline	1 (4+) ¹	64	78
	1 (3+)		
	1 (2+)		
Gonorrhoea	1	30	114

¹The same subject.

At this same health clinic, sponsored by both federal and state health departments, tests and examinations were made for these three diseases. Of the 145 members included in this study, 77 attended the clinic. Records of a few others were furnished by the Pipestone Indian School hospital to which these people were sent if hospitalization were necessary.

Of those having a positive reaction to the Mantoux test (table 6), one was suspected of having active cervical adenitis, seven were diagnosed as having evidence of healed primary pulmonary tuberculosis, and one as having healed cervical lymphadenitis. There was no conclusive evidence of any active tuberculosis among those examined. Although the data covered only 56.5 per cent of the population, it is thought to offer a fair picture of the physical condi-

tion of these families as the healthy and the working men were those who failed to attend. A good attitude toward medical attention and the fact that such treatment was free further confirmed this belief.

Of the 77 examined for trachoma, (table 7) 96.1 per cent were free from the disease and 3.9 per cent had evidence of healed trachoma; these three were all over 60 years of age. No active trachoma was discovered.

Available records showed positive evidence of one case of syphilis and one of gonococcus infection (table 8) both of whom were under treatment. One of these had reported on her own initiative previous to the time the clinic was held. The two Kline positives (2+ and 3+) failed to give positive Kolmer-Wassermann reactions. One case of venereal disease had developed and had been treated since June, 1937, but this person was a transient so was not included in this study.

No rickets was observed either active or healed as indicated by "scars". No cripples were noted; only one mentally subnormal person was observed by the investigator.

Skin diseases, such as impetigo and scabies, also have been thought to be prevalent among Indians. This study failed to show any such evidence as judged with clothing on and without medical examination. The physician knew of no

cases. One skin defect of another type was noted; this had received medical attention and had been checked.

The government physician in Morton stated that these people were remarkably free from chronic diseases. During the winter, two abscesses and one case of pneumonia were treated. The child having pneumonia had always been in rather poor health; it was expected that during the summer she would receive special medical attention. Any necessary tonsillectomies would be done at the hospital at the Pipestone Indian School before the fall school term.

Whooping cough, influenza, and one case of pneumonia, and tonsillectomies lowered the school attendance for the year, 1937-38, from an enrollment of 43 to an average attendance of 28 children. Only two children were out of school definitely from choice.

From these facts it may be concluded that the general health conditions were good. However, generally speaking the medical services rendered these people exceeded that of their white neighbor of equal economic circumstances. Much has been done for the Indian in the line of preventive medicine. Seemingly, the people still believed that medicine or other remedies were necessary prescriptions; the causes of disease was too little understood. Because of this lack of knowledge if one child had a contagious or

infectious disease, it was probable that all would be exposed.

The family members were asked to report any deaths among their children, at what age they had died, and the supposed cause (table 9). The deaths totaled 56; 31 or 55.4 per cent of these died under one year of age. Of these deaths under one year, pneumonia was the cause of eight, the most reported for any one disease in that age group. The only deaths recalled during the past year were those of two elderly people. The investigator knew of five births the past year, although two were off the reservation at the time of the study. This would make the birth rate for the past year $2\frac{1}{2}$ times that of the death rate.

Finances and Standards of Living

These people, although located in a farming area, had too little land to provide a living. Plans had been made for larger tracts to be purchased and for funds to assist the Indian in purchasing farm equipment and improvements. Until such time should come, the men received their income chiefly from the Works Progress Administration. At the time of the study, 90 per cent of the families had a government assignment of 10 to 27 acres, partially suitable for farming purposes (table 10).

Table 9. Deaths reported among the immediate members of the 30 Indian families.

Reported cause	Age at death				Individuals	
	Under 1 yr.	1-6 yrs.	7-17 yrs.	18-60 yrs.	Total	Per cent
Accidental	0	0	0	2	2	3.6
Appendicitis	0	1	2	1	4	7.1
"Brain fever"	2	0	0	0	2	3.6
Burned	0	1	0	0	1	1.8
Contagious disease	1	0	0	0	1	1.8
Deformity	1	0	0	0	1	1.8
Diarrhea	1	0	0	0	1	1.8
Heart trouble	0	0	0	2	2	3.6
Influenza	0	0	0	2	2	3.6
Intestinal tuberculosis	0	0	0	1	1	1.8
Miscarriage	0	0	0	1	1	1.8
Pneumonia	8	2	0	0	10	18.0
Premature	6	0	0	0	6	10.7
"Quick consumption"	0	0	4	0	4	7.1
Stillborn	4	0	0	0	4	7.1
Stomach disorder	0	1	2	1	4	7.1
Tuberculosis	0	0	0	1	1	1.8
Unknown	7	0	0	1	8	14.2
Whooping cough	1	0	0	0	1	1.8
Total	31	5	8	12	56	100
Per cent	55.4	8.9	14.3	21.4	100	100

Table 10. Property or land held by the 30 Indian families.

Type of holding	Family		Notes
	Number	Per cent	
Government assignment	27	90.0	Farm land- 10 to 27 acres to each family.
Owned	1	3.3	Govt. holds an option for purchase.
Rented	2	6.7	Town property. Diocese property.

Of the 30 families, 28 or 93.3 per cent had work as a source of income (table 11).

Table 11. Sources of income of the 30 Indian families.

Source	Amount	Families	
		Number	Per cent
Work	Approximately \$44.00 per month	28	93.3
Other than work and commodities		16	53.3
Old age pension	\$10-\$20 per person per month	6	20.0
Relief commodities	Ave. of 74.8 lb. per family per month	27	90.0
Indian payment	Variable	1 ¹	3.3
Lease land	1/3 of the crop on 10 to 27 acres	13	43.3
Insurance policy	\$57.50 per month	1	3.3

¹A Santee Sioux.

The supplementary sources consisted chiefly of old age pensions, an insurance policy, and money from crops on leased land. The one Indian payment was that received by a Santee Sioux who lived in this settlement in order to care for an aged aunt and uncle. The Mdewakanton Sioux had received no Indian payments for many years.

The average income per family for the month of May was \$55.34, with an average of 1.5 contributors per family (table 12).

Table 12. Income data for the 30 Indian families.

Income	Amount	Individuals	Per cent
Total per year	\$14,876.00		
Ave. per year	495.00		
Ave. per mo.	41.30		
Total cash income last mo.	1,666.00		
Ave. per mo.	55.34		
No. contributing to income last mo.		46	
Ave. per family		1.5	
Exp. for food last mo.	888.00		
Ave. per family	30.62		
Ave. per capita per day	.20		
Ave. percentage of income spent for food			53.3

The average monthly income for the year past amounted to \$41.30, less than that for May of the current year. The people availed themselves of all opportunities to work but these were scarce during the winter season in this section of the country at a time when food and warmer clothing are needed.

Of the May income, 53.3 per cent was spent for food. This left little for other necessities although it may be recalled the Indians, with the exception of two families, paid no rent. On a per capita basis, the average daily amount spent for food was 20 cents (table 12). This was in addition to the 74.8 pounds which was the average amount of food issued to 27 Indian families during the month of May, 1938, by the County Welfare Board (table 13).

Thorn apples, elderberries, strawberries, plums, and chokeberries were the wild fruits most used by these people. Greens, pheasant, and fish were other available wild foods. Some use of such foods was made by 80 per cent of the families (table 14).

Table 14. Indian families using food grown on reservation.

Source	Families	
	Number	Per cent
Garden	26	86.7
Wild food	24	80.0

Table 13. Food commodities issued to the Indians by the County Welfare Board for May, 1938.

Family no.	Potato flour lbs.	Rice lbs.	Dried apples lbs.	Oranges lbs.	Cabbage lbs.	Grape-fruit lbs.	Total lbs.
1.	3	3	8	25	11	35	85
2.	0	0	0	0	0	0	0
3.	3	4	11	35	16	50	119
4.	4	4	11	45	18	50	132
5.	1	1	4	10	9	15	40
6.	2	2	5	20	9	20	58
7.	2	2	5	20	9	20	58
8.	1	1	4	10	9	15	40
9.	5	5	13	52	24	50	149
10.	4	4	12	45	18	50	133
11.	1	1	4	10	9	15	40
12.	1	1	4	10	9	15	40
13.	3	4	11	35	16	50	119
14.	1	1	4	10	9	15	40
15.	0	0	0	0	0	0	0
16.	2	2	5	20	9	20	58
17.	3	3	8	25	11	35	85
18.	3	3	9	35	14	40	104
19.	1	1	2	7	3	7	21
20.	1	1	4	10	9	15	40
21.	2	2	7	20	11	30	72
22.	1	1	2	7	6	7	24
23.	4	4	12	50	20	60	150
24.	4	4	12	50	20	60	150
25.	0	0	2	0	0	20	22
26.	2	3	7	20	11	30	73
27.	1	1	2	7	6	7	24
28.	2	2	5	20	9	20	58
29.	3	3	8	25	11	35	85
30.	0	0	0	0	0	0	0
Total	60	63	181	623	306	788	2,019
Ave.	2.3	2.3	6.7	24.0	11.8	29.1	74.8

Farming activities were confined almost entirely to the small gardens owned by 86.7 per cent of the families (table 14). Their other land was leased for 1/3 of the crop as the Indians had little equipment with which to farm. Some type of food preservation was practiced by 80 per cent of the families (table 15).

Table 15. Food preservation.

Type	Families	
	Number	Per cent
Canning	22	76.6
Drying	5	16.7
Storage in root cellar	15	50.0
Combination of above methods	24	80.0

The rehabilitation program enabled some families to provide basements for storage of root crops, which indirectly added variety to the diets. The foods commonly stored in this way were carrots, potatoes, rutabagas, squash, beets, and parsnips.

All the cows, horses, and swine were owned by one family who also had 25 chickens (table 16).

Table 16. Animals owned by the Indian families.

Kind	Total	Families	
		Number	Per cent
Chickens	232	7 ¹	23.3
Cows	2	1 ¹	3.3
Goats	10	1 ¹	3.3
Horses	3	1 ¹	3.3
Swine	6	1 ¹	3.3

¹The same family also owned 25 chickens.

Another family owned 10 goats while the six other families totaled 207 chickens. An order had been signed for W.P.A. funds for labor to build barns and chicken houses, the material for which was secured by loans. Some of the chicken houses were being built at the time of this study. Plans had been made for securing chickens, cows, horses, and farm equipment as needed by the families.

The family who lived in Morton was the only one who had electric lights, bath tub, telephone, and outside help (table 17).

Table 17. Evidence of standard of living.

Evidences	Families	
	Number	Per cent
Telephone	1	3.3
Autos	14	46.7
Help	1	3.3
Sewing machines	16	53.3
Radios	19	63.3
Wind-chargers	2	6.7
Musical instruments	4	20.0
Reading material	21	70.0
Games	9	30.0

Automobiles had been purchased as the earning power increased. In part, these were necessary as the men drove each morning to Redwood Falls, seven miles distant, to join other W.P.A. workers going out from there. However, the automobile payments and gasoline took most of the money left from the food purchases. Almost half or 46.7 per cent of the families owned a car. Other evidences of standards of living consisted of sewing machines, radios, wind-chargers, musical instruments, reading material, and games. One family who owned a wind-charger for generating electricity for the radio had one electric light. Reading material included for the most part the Sunday paper and an occasional magazine. The games of the nine families who reported such were mostly card games played during the winter months.

Plate I



Fig. 1. A shack typical of the homes before the rehabilitation program.

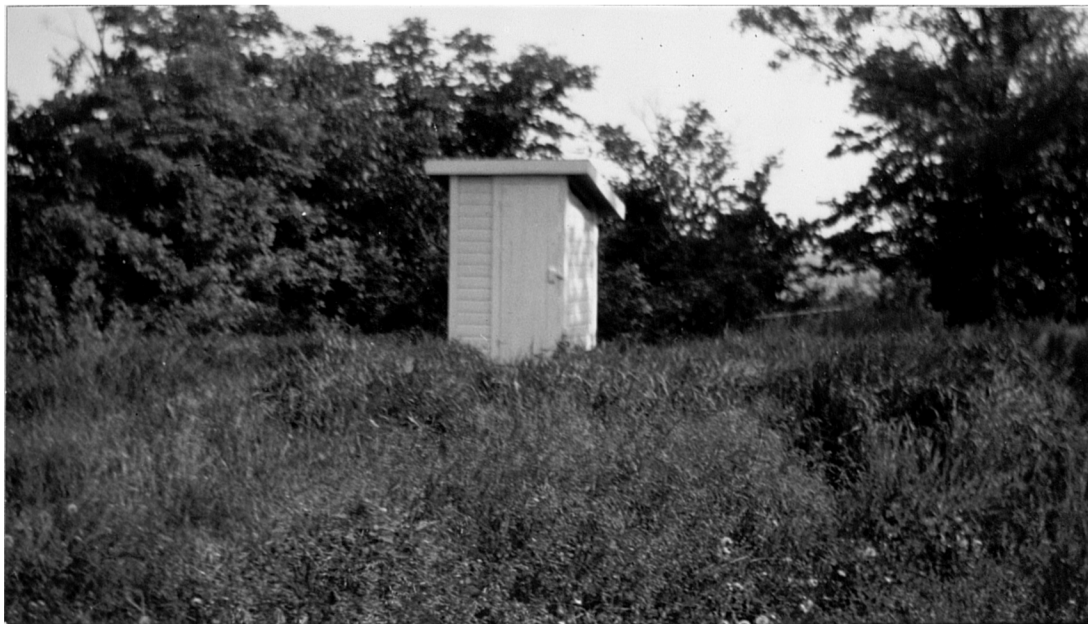


Fig. 2. Type of toilet constructed by the government.

Plate II



Fig. 1. Before rehabilitation.



Fig. 2. After rehabilitation.

Plate III



Fig. 1. Before rehabilitation.



Fig. 2. After rehabilitation.

Plate IV



Fig. 1. Before rehabilitation.



Fig. 2. After rehabilitation.

Table 18. Housing conditions.

Item	: Families no.
Style of house	:
Frame	:
Stucco	:
Shack	:
	:
Floors	:
Wood	:
	:
No. of rooms	:
1	:
2	:
3-5	:
6 or more	:
	:
Kitchen	:
With	:
Without	:
	:
Windows	:
Glass	:
	:
State of repair	:
Rehabilitated	:
Non-rehabilitated	:
Under construction	:
In good repair	:
	:
	:

¹This family had a new house under construction.

Table 19. Rehabilitation of homes by the government.

Family no.	State of rehabilitation	Type of financial aid		
		Loan	Grant	None
1.	Partially new	1		
2.	Razed and rebuilt	1		
3.	Negative			1
4.	Partially repaired	1		
5.	Repaired		1	
6.	Repaired		1	
7.	New	1		
8.	New	1		
9.	Repaired	1		
10.	Repaired	1		
11.	Agency house			1
12.	New	1		
13.	New	1		
14.	Repaired	1		
15.	New (under construction)	1		
16.	New	1		
17.	Repaired		1	
18.	Diocese property			1
19.	Deeded land ¹			1
20.	Repaired	1		
21.	New	1		
22.	Repaired		1	
23.	Repaired	1		
24.	Repaired	1		
25.	Repaired		1	
26.	Repaired		1	
27.	Repaired		1	
28.	New	1		
29.	New	1		
30.	Town property			1
Total		17	8	5
Per cent		56.7	26.6	16.67

¹Under option to become govt. property.

made permanent with basements underneath and higher foundations.

All of the families had stoves, eight having both kerosene and wood types (table 20).

Table 20. Equipment used in preparation, service, and preservation of food.

Item	: Families no.
Stove	:
Wood	: 27
Kerosene	: 11
Table	:
Dining	:
Adequate for size of family	: 15
Inadequate for size of family	: 6
Kitchen table used for eating	:
Adequate for size of family	: 5
Inadequate for size of family	: 4
Food storage facilities	:
Kitchen	: 11
Hole in ground	: 2
Cave	: 2
Well	: 5
Basement	: 12
Spring	: 1
In water in shade	: 3
Fireless cooker	: 1
Cistern	: 1
Icebox in summer	: 1
Electric refrigerator	: 1
	:
	:

During the winter, wood stoves furnished heat for the house as well as for cooking. Some of the stoves were in excellent condition. Tables for eating consisted of both kitchen and dining room types. However, only 66.7 per cent of them could accommodate all the family members at one time.

Food used from day to day was stored in the basement in 12 cases while 11 families kept food in the kitchen; others had various facilities or devices for storage of food (table 20).

Screened windows were found in 50 per cent of the homes (table 21). Others may have screen to replace the Table 21. Sleeping conditions.

Item	: Families
Windows in house	: no.
Adequate	: 28
Inadequate	: 2
Screened	: 15
Partially screened	: 3
Unscreened	: 12
Sleeping facilities	:
Sleeping rooms	: 56.0
Ave. no. per family	: 1.9
Ave. no. sleeping in each room	: 2.4
Beds	: 85.0
Ave. no. beds per family	: 2.8
Sleeping in beds	: 136.0
Ave. no. sleeping in each bed	: 1.6
Sleeping on floors	: 9.0
	:

storm windows yet in evidence but they were not reported. All but two houses, one of which was the shack, had adequate windows.

A few reported sleeping with windows closed at nights. This would obviously be true for those with no screens as mosquitoes were numerous. Two old women living alone, locked the doors and windows at night for fear of intruders or the dangers of night air. On cold winter nights one would undoubtedly find the windows closed, yet in most of the homes the construction would provide some ventilation. At the time of the study no one slept outside; during hot weather some moved outdoors to sleep if mosquitoes permitted.

There was an average of 1.9 sleeping rooms per family with 2.4 persons occupying a room (table 21). The largest number sleeping in one room was seven; this happened in two families which had one-room homes. The 85 beds reported gave an average of 2.8 per family; however, some of the beds were single and nine individuals (eight in one family and one in another) were reported to be sleeping on the floor.

As a whole the families retired and awakened early; this was necessary in order that the men could get to their work. All members of all ages averaged more than eight

hours of sleep daily if the hours were reported correctly (table 22).

Table 22. Hours of sleep reported for the 145 members of the 30 Indian families.

Age-group		Ave. hours per day
years	:	
Under 1	:	16.3
1-6	:	11.0
7-17	:	9.8
18-60	:	8.3
Over 60	:	8.8

Except for one yard the sanitary conditions on the reservation were particularly good (table 23). With few exceptions the homes were clean and orderly in spite of the muddy weather and various hours at which the investigator called. With addition of wells and improvement of springs by the government, good water was brought within reasonable distance of all the families. Two of them carried water in milk cans, while the remainder used pails; the family in Morton had city water. The ease with which water was secured had done much to raise the standards of cleanliness. Bath facilities consisted almost entirely of wash tubs which evidently were in frequent use. In the summer, the

Table 23. Sanitary conditions.

Item	Families no.
Water source	
City	1
Dug well	71
Drilled well	131
Spring	92
Toilet	
Type	
Indoor	1
Outdoor	28
Outdoor under construction	1
Condition	
Good	28
Poor	2
Slope	
Toward house	15
From house	4
None	10
Bath facilities	
Washbasin	1
Wash tub	28
Bath tub	1
Cleanliness	
Floors	
Clean	24
Dirty	6
House	
Orderly	28
Disorderly	2
Dishes	
Washed and stored	25
Unwashed	5
Beds	
Made	26
Unmade	4
Yard	
Orderly	27
Disorderly	3

¹These 20 families used nine wells.
²The nine families used two springs.

streams were used for bathing. The physician and the teacher in the local school both mentioned the personal cleanliness of these Indians. This quality in the Indian children excelled that of the few white children who attended the same school. It was observed that a common towel was generally used in the homes though one family had paper towels for the kitchen.

With the exception of two homes, the outdoor toilets were in excellent conditions (table 23). This probably was true because the government had supervised the building of the greater per cent of them (Plate I, fig. 2). Another family was constructing its own; upon its completion 90 per cent of the group would have adequate toilet facilities.

Much could be said about the appearance of the homes in general; in view of the fact, that incomes were small and equipment meager, the homes were attractive. Curtains, potted plants, rugs, linoleums, and pictures, were found in almost every home. Most of the furniture was good considering the income. Various members of one large family had contributed improvements and secured furniture from time to time until the home was quite comfortable and attractive (Plate IV, fig. 2). In a measure, the same could be said of other families on the reservation although some were less ambitious.

Diet

According to the United States Public Health Service Report of 1912 (4), it was said concerning the Indian, "His dietary regimen is marked by periods of repletion when he is in funds and of abstinence when the larder is low". Those working with the Indians for long periods of time have believed them to be either in the state of a "feast or a famine", i. e., they ate abundantly until the supply was depleted following which point there was a period of starvation until the stores could be replenished. Apparently the same was true at this reservation. Immediately following pay day (twice a month) when a new supply of groceries was purchased and after relief commodities were issued, the families "feasted". The general opinion was that the fruit, especially, was eaten within a relatively short time when it might have been distributed over the two-week interval. Grapefruit was eaten in the same manner as oranges and apples. But there was little complaint during the "famine" period which agreed with the statement of Beckwith (1).

The dietary data were taken at the end of the month but before the pay checks had been received, and at a time when the families had had no issue of commodities for at least a week preceding the study. Also the food stored

for winter had been used for the most part and the gardens had been planted only a short time so were not yet furnishing food. It would appear that the week covered by the study may be regarded as typical of the diets of certain times each month but representing neither the best nor the worst.

The investigator was able to learn of only six charge accounts carried in Morton for Indian customers. This was attributed to the fact that the families had regular pay checks which permitted them to shop in Redwood Falls, at chain stores where choice and prices were better. Merchants there were pleased with their dealings with the Indians. One told of having played for the Indian children who danced at the "Amateur program" in Redwood Falls. Some of the performers won cash prizes and, to show their appreciation for his kindness, the families patronized his store.

All who were in any way connected with this reservation believed the merchants to be fair and just in all dealings with the Indian. He was charged the same price as the white customer. However, Indians here could and would stand for their own rights, e.g., an unintentional error was made by a clerk but before she could see the customer to correct it, he had returned to complain.

Merchants were of the opinion that the Indian families, realizing their financial limitations, tried to buy food within their means expecting to make it last until another pay day. Staples were the principal items purchased and few extravagant foods were included. Grocers allowing charge accounts believed the Indians bought smaller amounts and cheaper food than their white customers. Advantage was taken of "specials", e.g., over-ripe bananas. Canned foods consisted mostly of milk, peas, tomatoes, and corn with occasional purchase of kraut and fruit. The fresh fruits chosen were oranges, apples, and bananas. Prunes were the preferred dried fruit. Fresh vegetables were seldom included. Cakes, cookies, and candy were rarely bought. Because the Indian had no relief orders, tobacco was listed with the groceries, but only in small amounts.

Purchasing supplies in quantity has been considered a means of extending the food budget, but such a practice defeated its purpose at this reservation. A plentiful store brought many visitors who came to "feast" and encouraged the borrowing habit already too much in evidence. However, borrowing appeared to be less common after a regular income was secured. But there remained the problem of the inability of the family to distribute the food over a period of time.

A noon meal, prepared by an Indian cook, was served daily at the school. This lunch consisted of potatoes and gravy or a potato substitute, another vegetable, two cups of milk per child, and crackers or biscuits. Meat and fruit (prunes, dried apples, etc.) were each served twice a week. School had just closed before the time of the investigation so these foods were omitted from the diet records.

Twenty-eight families were included in the study of food intakes. Two families were omitted as definite and accurate data for them were not available. However, when other investigations were made, their diets in general could be rated and scored.

Stene and Roberts (16) suggested that the Sioux Indian possibly disliked milk, but in this study 96.3 per cent of the family members reported a liking for this food. True, the average daily consumption of 0.48 pints was low (table 24) but there appeared to be reasons for this.

Table 24. Milk intake for 28¹ Indian families.

Milk	Individuals		Family	
	Number	Per cent	Number	Per cent
Like	132	96.3		
Dislike	5	3.7		
Form used				
Cow				
Evaporated			22	78.6
Raw			6	21.0
Pasteurized			8	28.6
Goat			1	3.8
Total pts. per day per family			65.1	
Ave. pts. per day per family			2.3	
Ave. pts. per capita per day	.48			

¹No definite data on intake for other two families.

Evaporated milk was used almost entirely except for the bottled milk bought directly after pay day. Distance from the store made it almost impossible to have fresh milk except occasionally. The family in Morton used pasteurized milk only. Some families had milk only for coffee and cereal. One housewife told of putting the canned milk into the coffee which was then poured over the cereal. This practice was also reported by Stene and Roberts (16). The families were eager to have cows in order that the milk problem might be solved. The investigator believed the

Indians would drink milk if they had it and that they had no active dislike for it. Families 7, 8, and 11 scored A on milk intake but they had no children (table 25) which lowered the requirement. The milk score of B was received by the family having goats. The one (No. 24) rated only C because of its large size and the fact that milk was given to a married daughter. The E group was composed of 46.7 per cent of the families; the average of the 30 families for milk intake was D-.

Potatoes were the most popular vegetable (table 26). Spinach, greens, green beans, cabbage, lettuce, and peas were the green vegetables commonly eaten. Asparagus was seldom mentioned. Carrots, yellow corn, and sweet potatoes were the yellow vegetables being eaten at the time of the study. In the fall and winter, squash and rutabagas were used if they were grown in the gardens and stored for winter, and at times rutabagas were among the foods furnished by the County Welfare Board. The raw vegetables used were cabbage, lettuce, carrots, tomatoes, radishes, and onions, with celery occasionally by one or two families. The average intake of green, yellow, and raw vegetables was especially low.

Consumption of citrus fruits, tomatoes, and other fruits was good (table 26), no doubt due to the fact that

Table 25. Diet scores for 30 Indian families.

No.	Family		Diet scores ³																				
	Composition:		Milk intake					Food intake other than milk					Eating habits					Total					
	Ad. ¹	Ch. ¹	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
1.	2	5					E			C				B								D	
2.	2	1				D						E		B								D	
3.	3	3					E					E		B								D	
4.	2	3 ²				D				C					C							D	
5.	5	2 ²				D						E			C							D	
6.	4	0				D						E		B								D	
7.	2	0	A								D			B							C		
8.	2	0	A								D			B							C		
9.	4	6					E					E				D							E
10.	2	4				D						E			C							D	
11.	2	0	A								D		A						B				
12.	2	1						E						B								D	
13.	2	5					E					E					E						E
14.	4	2					E					E		B								D	
15.	3	3		B						C												D	
16.	2	2				D					D				C		D				C		D
17.	5	0					E				D					D							E
18.	4	1			C					C					C						C		
19.	3	4					E					E					E						E
20.	2	0					E					E											E
21.	2	2					E					E				D							E
22.	1	0					E									D						D	
23.	3	6					E									D						D	
24.	7	2			C						D				C							D	
25.	4	0				D					D				C							D	
26.	1	2					E					E				D						D	
27.	1	0					E					E					E						E
28.	2	1				D						E					E						E
29.	2	3				D					D				C							D	
30.	2	5				D			B				A								C		
Total	82	63	3	1	2	10	14	0	1	6	8	15	2	8	8	8	3	0	1	5	17	7	
Average						D-						E-			C-							D	
Per cent			10.0	3.3	6.7	33.3	46.7	0.0	3.3	20.0	26.7	50.0	6.7	26.7	26.7	30.0	10.0	0.0	3.3	16.7	56.6	23.4	

¹Ch.-children under 18 yrs. Ad.-adults.

²Infant not included in food intake.

³See table 1 for diet standards.

Table 26. Food intake other than milk for 28 Indian families.

Food	Unit per week	Average	Families		
			Lacking entirely Number	Attaining standard ¹ Number	Per cent
Vegetables					
Potatoes	serving	9.3	0	24	85.7
Green	serving	3.5	6	4	14.3
Yellow	serving	2.1	4	2	7.1
Raw	serving	2.4	7	2	7.1
Fruits					
Citrous or tomato	serving	6.6	2	16	57.1
Other	serving	6.9	0	20	71.4
Meat	serving	6.5	0	20	71.4
Eggs	dozen	2.4	1	24	85.7
Butter	pound	1.6	1	23	82.1
Lard and other fats	pound	3.0	0		
Grain products					
Bread					
White	loaf	10.1 ²	0		
Whole grain	loaf		25		
Cereal					
Refined (macaro- ni, rice)	pound	2.9	0		
Whole grain	serving	5.3	1	18	64.3
Flour	pound	20.0	0		

¹See table 1.²Mostly homemade.

some of these were supplied as "commodities" (table 13). Bananas, oranges, apples, and dried prunes were purchased, however, and one family had bought lemons and another strawberries.

The Indian diet in early days was known to consist largely of meat but this study showed (table 26) these families averaged a little less than one serving of this food daily. Popular meats (table 27) were bologna, wieners, hamburger, boiling beef, and occasionally ham, steaks, and pork chops were rare treats. Bacon was commonly used, partly perhaps, because of its flavoring or seasoning qualities. One merchant believed bologna was chosen because of its low cost; ease of preparation might have been a better explanation for the usage of certain types of meat. Another grocer said that if the budget of the Indian would permit, the grocery order would consist of 50 per cent of meat, but if he had little money he knew he must be content with boiling beef. Many of the families mentioned stews and soups, especially, which suggested that their beef was commonly extended. Little cheese was used according to the merchants and the observations of the investigator.

Eggs were lacking in only one diet (table 26). This differed from the findings of Stene and Roberts (16) in

Table 27. Typical grocery orders of three Indian families.

Family no. 11. (2 adults)				Family no. 16. (2 adults; 2 children under six)				Family no. 25. (4 adults)			
Total food	Value	Meat	Value	Total food	Value	Meat	Value	Total food	Value	Meat	Value
Bread	\$0.13			Sugar	\$0.63			Weiners	\$0.60	Weiners	\$0.60
Hamburger	0.30	Hamburger	\$0.30	Lard	0.60			Bananas	0.25		
Lard	0.15			Oatmeal	0.22			Seeds	0.15		
Butter	0.31			Butter	0.31			Cream	0.20		
Lamp chimney	0.15			Yeast	0.03			Sweet potatoes	0.15		
Flour	0.90			Potatoes	0.40			Weiners	0.90	Weiners	0.90
Bologna	0.45	Bologna	0.45	Soap	0.25			Bottle	0.05		
Soap	0.10			Onions	0.15			Beans	0.24		
Soap	0.05			Cocoa	0.25			Picnic ham	1.20	Pic. ham	1.20
Jam	0.39			Corn starch	0.10			Pickles	0.25		
Bread	0.13			Bologna	0.30	Bologna	\$0.30	Coffee	0.27		
Sugar	0.25			Buns	0.12			Milk	0.30		
Tea	0.23			Bologna	0.10	Bologna	0.10	Crackers	0.19		
Yeast	0.06			Rolls	0.12			Weiners	0.90	Weiners	0.90
Yeast	0.03			Milk	0.04			Bread	0.26		
Bread	0.13			Baking powder	0.25			Salad dressing	0.23		
Butter	0.31			Hamburger	0.25	Hamburger	0.25	Peaches	0.25		
Pork	0.25	Pork	0.25	Cookies	0.15			Bread	0.13		
Rolls	0.12			Potatoes	1.00			Sugar	0.63		
Cheese	0.15			Potatoes	0.39			Total	\$7.15		\$3.60
Candy	0.10			Cookies	0.20						
Eggs	0.20			Sugar	0.20						
Pork chops	0.40	Pork chops	0.40	Bologna	0.20	Bologna	0.20	Per cent of total cost			
Butter	0.31			Matches	0.05			spent for meat			
Vegetables	0.17			Total	\$6.61		\$0.85	50.4			
Yeast	0.03										
Bananas	0.25			Per cent of total cost							
Sugar	0.25			spent for meat				12.7			
Salad dressing	0.13										
Eggs	0.20										
Liver sausage	0.20	Liver sausage	0.20								
Sweet potatoes	0.15										
Hamburger	0.40	Hamburger	0.40								
Total	\$7.38		\$2.00								
Per cent of total cost											
spent for meat								27.1			

the study of the Crow Creek Sioux when they said, "That eggs have no prominence in the diet is shown by the fact that in no case were eggs served in the day's dietary as secured for the 67 families at the time of this study". In this investigation, 24 families or 85.7 per cent attained the standard of half an egg a day, but actually more eggs were consumed as the average egg consumption for the 28 families was six per week. Some of the eggs were used in cooking, particularly in cakes, cookies, pies and puddings but for the most part they were boiled or fried. With an average per capita consumption of 0.9 serving of meat and 0.9 egg per day, supplemented with some fish and an abundant use of cereals, it would appear that there was no shortage of protein in the diets.

While some Indian groups apparently eat little butter, substituting lard in its stead (13) this did not appear to be true in this study (table 26). The possible low standard set for this study, of one-half ounce per capita per day was attained by 82.1 per cent of the families. It is believed if the budget would permit they would eat more butter; several housewives mentioned that the amounts purchased were soon eaten and then the family did without until more could be secured. One merchant believed that lard and butter were purchased in the proportion of 3:1,

while this report showed an average ratio of 3:1.6. Lard usage ran high in some cases, partly due to the frying of fish and bread. While meat was prepared in various ways, fish was always fried. Lard was preferred to hydrogenated fats.

The large quantities of bread consumed (table 26) consisted almost entirely of the white yeast variety. Five families ate some whole grain bread. In general, the bread was homemade with an occasional purchase from the bakery to "stay over" until another baking or until money could be had for a sack of flour, or for sandwich-making for special occasions. The older housewives served more "fried bread" and biscuits than did the younger ones. This use of "fried bread" might explain the large amounts of syrup purchased by some Indian customers. Toast was found on the breakfast menu, distinctly a white man's food.

Breakfast cereals consisted chiefly of oatmeal which in many instances was served every morning. Of the 28 families, 26 reported cereals served at every breakfast. Cornflakes and other ready-to-eat products were used more frequently in the summer.

According to the statements of the families, rice and macaroni were used in large quantities (table 26). The

merchants also said these refined foods were frequently purchased. Five-pound packages were commonly mentioned when the supply for the month was being recalled. The housewives spoke often of "stretching" meat or "making it go further" which may be one explanation for the use of such large quantities of rice and macaroni. Ease of preparation and storage might be another explanation.

A limited amount of corn meal was used for making both bread and mush. Some homemade hominy was eaten. A little "squaw" corn was grown in the gardens and small quantities were dried for winter. However, in general the findings agree with Doyle (5) that the nomadic Indian used little corn.

The grain products consumed by the 28 Indian families were undoubtedly high as evidenced by an average of 20 pounds of white flour per family per week in addition to the other items noted. The only whole grain used in any quantity was rolled oats. The diets, with this exception, were deficient in whole grain products.

Merchants reported that coffee was purchased in small quantities; however, it was served at least once a day in every family (table 28). Tea was used at the other two meals, especially by the older Indians, as Netz (13) found in her study of the Chippewa food habits. One grocer said

Table 28. Eating habits of the 30 Indian families.

Habit	Families no.	Individuals no.	Per cent
Candy			
Frequency of eating			
Often	2		6.7
Occasionally	23		76.6
Never	5		16.7
Time eaten			
At meals	1		3.3
Between meals	24		80.0
Coffee-times per day			
One	27		90.0
Two	1		3.3
Three	2		6.7
Tea-times per day			
One	10		33.3
Two	17		56.7
Occasionally	1		3.3
None	2		6.7
Breakfast eaten			
Always		140	96.6
Never		5	3.4
Meals per day			
Three	29		96.7
Two	1		3.3
Food eaten between meals			
Suitable	11		36.7
Unsuitable	13		43.3
None	6		20.0
Eating environment			
Good	17		56.7
Medium	5		16.7
Poor	8		26.7
Appetite			
Good		140	96.6
Poor		5	3.4

Indian families purchased three times as much tea as did the white families. The cheapest tea and coffee were used. The serving of tea or coffee between meals was noted in two instances. Only two families reported that their children never drank tea or coffee. Nectar was proving to be a popular beverage as summer approached. The investigator surmized that during the warm months it appeared on the menu almost daily.

None of the families omitted breakfast and 29 reported serving three meals a day. A total of five individuals failed to eat breakfast regularly and two of these never ate this meal. Breakfast was heavier than the one often served in the white home. The early rising hour and the need of a meal suitable for working men were suggested explanations.

The eating of candy was reported to be a small problem (table 28), in comparison to common belief. Some had candy only when the merchant gave it as a reward for payment of a bill. The merchants reported that they sold the Indians little candy; occasionally a child had a few pennies for candy. Perhaps the dime stores sold them candy as it was probable more was eaten, judging from the observations of the investigator of Indian children in schools off the reservation. If they had candy they ate

it between meals.

Eating between meals was a rather popular practice (table 28) especially for the children. If fruits, such as oranges and apples were at hand, the children "pieced" on those. No doubt the desirable between meal foods disappeared rapidly, after which bread was eaten.

In most cases the eating environment (table 28) was good except for those whose tables were of inadequate size. Colorful oilcloth or cotton cloths were frequently in evidence. Poor appetites were reported by five members, all of whom had poor health. One of the five failed to eat breakfast.

In general it may be said that the eating habits were good as indicated by the average score of C+ for the 30 families (table 25).

Summary of the diets. The average amount of milk consumed averaging 0.48 pint per capita per day, was low, scoring D- for the 30 families (table 25). This milk was chiefly canned and was used for the most part in coffee and on cereals.

The amounts of green, yellow, and raw vegetables used in the diets were extremely low. Potatoes were popular. Few canned vegetables were eaten.

Home cooked cereals, fruits (especially citrus and

tomatoes), eggs, and butter were the redeeming features in the diets. Eggs were boiled or fried. Cheese had little place in the diet.

Meat was apparently adequate in amount but often the kind was undesirable. Stews and soups were popular. Meats were cooked by various methods; fish was always fried. Fat intake was high; three pounds of lard to 1.6 pounds of butter was the average proportion of these fats consumed.

Rice and macaroni were used in quantity. An average of 20 pounds of flour per week per family and occasional small quantities of cornmeal were used. Pastries were made at home as was the yeast bread, chiefly white. "Fried bread" and biscuits were made frequently.

For food intake other than milk, one family received a score of B; 50 per cent of the families scored E while the whole group averaged E+.

Tea or coffee was served at almost every meal. Three meals per day with a good breakfast was an established habit. Candy was eaten occasionally between meals. Children, especially, ate between meals. The eating environment was in general good except for the inadequacy of table space. Eating habits scores were: 6.7 per cent A, 26.7 per cent B, 26.7 per cent C, 30.0 per cent D, and 10.0 per cent E, with an average grade of C+.

The three scores for milk intake, food intake other than milk, and eating habits gave average total diet scores of: 3.3 per cent B, 16.7 per cent C, 56.6 per cent D, and 23.4 per cent E. No diets were rated as A, therefore none may be regarded as entirely adequate in all respects.

Infant Records

The three infants, one girl and two boys, none of whom were full-bloods, were classified as medium for degree of fatness (table 29). The two whose birth and present weights were known met the accepted standards for gain in weight for age. Nos. 1 and 5, cousins, were both born in the Pipestone Indian School hospital where the mothers were trained to care for their babies properly. An interesting note was that both infants were fed a specially prepared patent cereal highly approved for use in infant feeding. All three babies were on a schedule but only one slept alone. No. 19 slept the fewest hours which may be accounted for by the fact that he was one of a family of seven living in a one-room house.

No. 1 was breast fed until 6 mo. of age, and No. 5 had been partially breast fed from birth. This is believed to be particularly important for Indian children, as the infant mortality rate for the race is high. Infant No. 5

Table 29. Data on three Indian infants.

Family number	Infant number		
	1	5	19
Degree of Indian blood	3/4	1/4	3/8
Age in months	11	4	7
Sex	Male	Female	Male
Birth weight in lbs.	7.0	5.6	Unknown
Present weight in lbs.	24.0	11.0	Unknown
Degree of fatness	Medium	Medium	Medium
Breast fed	To 6 months	Yes	No
Bottle fed	From 6 months to 11 months	Yes	Yes
Combination	No	Yes	No
Formula	Oatmeal water	Patented milk preparation ¹	Canned milk
Foods other than milk	Cow's milk - Karo Patented cereal ¹ at first, cook- ed cereals now	Patented cereal ¹ Orange juice	Broths Mashed potatoes Mashed peas
On a schedule	Yes	Yes	Yes
Age weaned from breast	6 months	Not yet	Unknown
Sleeps alone	Yes	No	No
Hours of sleep	17.5	17.0	14.5
Disposition	Excellent	Fair	Good
Bath	Daily	Daily	Daily
General physical condition	Fair	Good	Good

¹Of highly approved type for infant feeding.

received orange juice in addition to cereal while No. 19 had broths, and mashed potatoes. At the time of the study, No. 1, 11 months of age, was receiving the family diet. The general physical condition of this child was only fair, but he had had whooping cough and influenza during the winter which may have accounted for his physical state. In spite of these illnesses and a pallid appearance, his disposition was good. However, the mother believed him to be "slower" than his four brothers had been. No. 5 also had had whooping cough but during the time of the study, she appeared to gain in weight to the point of becoming plump. A daily bath was reported for all three infants.

FINDINGS

1. Only 23.4 per cent of the 145 individuals composing the 30 families were full-blood Indians.
2. Housing conditions were good considering the income. This was the result of the recent rehabilitation program which made reconditioning possible.
3. The sanitary conditions of the homes were particularly good.
4. The general physical condition of the family members was good. There was no conclusive evidence of active tuberculosis, no active trachoma, and apparently no

ricketts or contagious skin diseases. The two cases of venereal disease were under treatment. In general the condition of the teeth was good.

5. The birth rate for the past year was two and one-half times the death rate.

6. Children under one year of age made up 55.4 per cent of the 56 deaths reported as having occurred during the existence of the 30 families.

7. Five infants were born during the previous year. The three remaining on the reservation were apparently receiving proper food and care.

8. The amount spent for food for the month of May represented 53.3 per cent of the average income of \$55.34 per family; in addition each family received an average of 74.8 pounds of relief commodities.

9. The consumption of milk was low; and that of green, yellow, and raw vegetables was extremely low. Potatoes were popular. Home-cooked cereals, fruits, eggs, and butter were the best features of the diet. Meat was adequate except for kind. Eating habits, with the exception of the use of tea or coffee each meal, were good.

10. Probably the greatest deficiencies in the diets were milk and vegetables other than potatoes. Tea and coffee were used to excess. No diets were rated as entirely adequate in all respects.

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LITERATURE CITED

- (1) Beckwith, Paul.
Notes on customs of the Dakotahs. Smithsonian Inst.
Annual Rept. 1886. 867 p. 1889.
- (2) Brackett, Albert Gallatin.
The Sioux or Dakota Indians. Smithsonian Inst.
Annual Rept. 1876. 472 p. 1877.
- (3) Collier, John.
Office of Indian Affairs. In annual report of the
secretary of interior. 410 p. 1937.
- (4) Contagious and infectious diseases among the Indians.
U.S. Public Health Service, Doc. 1038. 85 p. 1912.
- (5) Doyle, W. E.
Indian forts and dwellings. Smithsonian Inst.
Annual Rept. 1876. 472 p. 1877.
- (6) Eastman, Charles Alexander.
The Indian today. Garden City, New York. Double-
day, Page. 182 p. 1915.
- (7) Gardner, William Henry.
Ethnology of the Indians of the valley of Red River
of the North. Smithsonian Inst. Rept. 1870. 479
p. 1871.
- (8) Grinnell, George Bird.
The Indians of today. New York. H. Stone. 85 p.
1900.
- (9) Hrdlička, Alš.
Tuberculosis among certain Indian tribes. Bur.
Amer. Ethnol. Bul. 42. 36 p. 1909.
- (10) Klein, Henry and Palmer, Carroll E.
Dental caries in the American Indian children.
U. S. Pub. Health Bul. 239. 52 p. 1937.
- (11) Mirsky, Jeanette and Mead, Margaret.
Cooperation and competition among primitive peoples.
New York. McGraw-Hill. 531 p. 1937.

- (12) Mountin, Joseph and Townsend, J. G.
Observations on Indian health problems and facilities. U. S. Pub. Health Bul. 223. 47 p. 1936.
- (13) Netz, Irene.
A study of the food habits of the Chippewa Indians in Minnesota. St. Paul, Minnesota. State Relief Agency. 4 p. 1935.
- (14) Riggs, Stephen Return.
Siouian Indians. Wash. D. C. Contributions to North American Ethnology, 9. 239 p. 1893.
- (15) Salomon, Julian Harris.
Indian crafts and Indian lore. New York. Harper Bros. 410 p. 1928.
- (16) Stene, Jessie Anderson and Roberts, Lydia J.
A nutrition study of an Indian reservation. J. Amer. Diet. Assoc. 3(4):215-222. March, 1928.
- (17) Wissler, Clark.
North American Indian of the plains. ed. 2. New York. Amer. Mus. Nat. Hist. 160 p. 1920.