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revenue and gross cost figures in obtaining the price of milk of the average test of milk received. As for the price differential per 0.1 percent change in the milk fat test, the above formula applies as long as butter and powder are manufactured during the accounting period. Price relationships among manufactured dairy products remain sufficiently stable to make this practice essentially accurate and sound.

The above formulas for fixing values of milk delivered by farmers to butter-powder plants

are recommended only as guides. It is recognized that short-run supply-demand conditions, particularly the pricing policies of nearby competing plants may force plant owners and managers to depart somewhat from the prices determined by these formulas. However, over longer periods, competition in the industry can be expected to force dairy plants to pay prices to farmers which are close to the net farm value of milk. The above formulas facilitate this by providing feasible, simple, and accurate means of computing these values at all times.

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## Changes in Farm Land Ownership

By Buis T. Inman and Hilton E. Robison

*As land represents more than half of the investment in agriculture in the United States, it follows that the nature of its ownership is related to the public interest. Our national supplies of food and fiber depend upon the output of the land. Title to it confers upon the owner the right to use it as he wishes. He may let it lie idle or he may cultivate it; he may conserve it or exploit it. Also, the rights of ownership provide the basis for the sharing of its returns. Data covering the ownership of farms by operators are available from the Censuses of Agriculture as far back as 1880. But the first major study of the ownership of rented farm lands was made in 1925.<sup>1</sup> A much more inclusive study of ownership, for 1945, was conducted by one of the authors of the following paper and an associate.<sup>2</sup> In the following article, data on major types of owners in 1945 and in 1950 are compared to show the changes that occurred in the 5-year interim. The paper is based on a cooperative project of the Bureau of Agricultural Economics, and the Bureau of the Census.*

**S**IMILAR METHODS were used to ascertain the major types of owners of farm land, together with the acreage owned by them in 1950 and in 1945. For 1950, all land in farms was classified according to type of owner by taking a sample of approximately 146,000 of the 5,382,162 farms enumerated in the 1950 Census of Agriculture. The names of farm-owner operators and landlords listed for the

farms in the sample provided data as to the type of owners and the acreage held by each. For example, if the owner were a corporation, the ownership was classified as corporate. Similarly, if the owner were a person, ownership was classified as individual. The sample was a modification of one used for conducting a mailed questionnaire survey relating to farm-mortgage indebtedness. To determine the sampling rates, farms were separated into three strata, each of which was sampled separately. The strata were (1) all large farms, (2) other farms operated by the owner, and (3) other farms operated by part-owners, ten-

<sup>1</sup> TURNER, H. A. OWNERSHIP OF TENANT FARMS IN THE UNITED STATES. U. S. Dept. Agr. Bul. 1432. 1926.

<sup>2</sup> INMAN, BUIS T., and FIPPIN, WILLIAM H. FARM LAND OWNERSHIP IN THE UNITED STATES. U. S. Dept. Agr. Misc. Pub. 699. Dec. 1949.

ants, and managers. To arrive at reliable State estimates, rates of sampling each stratum were varied by States.

The sample for the owners of farm lands included 48.3 percent of all farms that were classified as large in the 1950 census. Large farms accounted for a third of all land in farms; they ranged by States from less than 2 percent of the land in farms in Ohio and Wisconsin to 95 percent in Arizona. The sample included all large farms in the 8 Mountain States and Rhode Island and a third or more of the large farms in all other States. In addition to a third of all large farms, all farms of 10,000 acres or more were included in the sample for the 3 Pacific States, North Dakota, and Florida. For South Dakota, all farms of 20,000 or more acres, and for Texas all those farms of 40,000 or more acres were included.

Of farms not classified as large, the sample included 1.8 percent of those that were operated by full owners and 2.5 percent of those that were operated by part owners, managers, and tenants. Sampling ratios of full owners varied by States from 1 percent in Ohio, Indiana, Minnesota, Missouri, Virginia, North Carolina, Kentucky, Tennessee, and Texas, to 20 percent in Rhode Island, Delaware, Wyoming, Arizona, and Nevada. The proportion of part owners, managers, and tenants ranged from 1 percent in North Carolina and Texas to 20 percent in all of New England except Maine, and in New Jersey, Delaware, Wyoming, Arizona, Utah, and Nevada.

To obtain the proportion of farm lands held by the various types of owners, the sample for each State was expanded on the basis of the sampling ratios. Land shown in the complete census enumeration as in large farms and in other farms, was then distributed in proportion to the acreages for which ownership was reported in the sample.

Land for which ownership was not reported or could not be ascertained comprised 2.8 percent of all land in the sample farms, varying from 0.4 percent in Kentucky to 6.2 percent in Texas. This acreage was distributed according to the proportion of land in each of the owner-type categories for which determination could be made.

The method of ascertaining acreage owned

by type of owner for 1945 was similar to that used for 1950. A random sample was selected from each county in each State.<sup>3</sup> The total number of farms in the sample approximated 150,000 from the total of 5,859,169 farms enumerated. The sampling rate varied from State to State, ranging from a fifth to a sixtieth, depending on the number of farms. The purpose was to get enough owners in the sample to make reliable State estimates. Because of the greater range in size of holdings in the West, a tabulation was made from reports prepared by enumerators for all farms in the 8 Mountain States. Similarly, a tabulation was made of all farms in the census sample for Texas, which comprised all large farms and one in eighteen of all other farms in the State. If a farm was owner-operated, the acreage was tabulated by type of landlord. If more than one landlord for a farm was indicated, the acreage was arbitrarily divided equally among the landlords, as the 1945 schedule did not give the acreage rented from each landlord.

Estimates on land ownership for both 1950 and 1945 are subject to sampling errors and to errors arising from the difficulty of classifying the types of owners. In some instances, the landlord reported by the farm operator may not have been the owner; he may have been the agent for a corporation or he may have rented from a corporation and subleased to the farm operator. Moreover, when the name of a firm, or the name of a farm or ranch was given, it was not always possible to classify the land properly as to whether it was corporately owned. Minor differences in percentages are therefore not significant; they do not indicate changes in land held by different types of owners.

Many factors have combined to determine the present ownership pattern of our farm land. Title to all the land in this country was at one time held by the Federal Government with the exception of the land which comprised the Thirteen Original Colonies and Texas and appropriated lands in the other territories at

<sup>3</sup> This sample was originally prepared as a mailing list for the national land ownership study. For a report of this study, see INMAN, BUIS T., and FIPPIN, WILLIAM H. FARM LAND OWNERSHIP IN THE UNITED STATES. U. S. Dept. Agr. Misc. Pub. 699. Dec. 1949.



the time of their acquisition. Disposal of the public domain through homesteading, sales, and grants to railroads and to States, had a marked effect on the pattern of ownership. Some lands, because of their low productivity or because they were required for special uses such as watershed protection, were retained in or reverted to public ownership, or were acquired by public agencies.

Economic conditions exerted a strong influence on the proportion of the farm land in private, corporate, and public ownership. Influential in determining the pattern of ownership were credits made available to farmers by private lenders and State and Federal agencies. State and Federal programs were developed to promote land ownership by farm operators. Another influence in this direction was State laws that regulated corporate ownership.

### Types of Owners

Owners of farm land in the samples for the 1950 and 1945 censuses were classified into four major types, based upon the names appearing on the census questionnaires. These were individual, corporate, Indian, and public.

**INDIVIDUAL**—If the census questionnaire indicated that land was owned by one or more persons, owners were classified as individual. Individual owners included one person, husband and wife, partnerships, undivided interests or estates, and life estates.

Farm land in the United States is largely held by individuals. Approximately 88 percent of the land enumerated in farms in the 1950 and 1945 Censuses of Agriculture was owned by individuals (tables 1 and 2). In 1950, 56 percent of the land was owner-operated, and in 1945, 53 percent. Ninety-eight percent of the farm land in the States east of the 100th meridian was owned by individuals, but only 81 percent in the 17 Western States. Florida was the only eastern State in which individuals held less than 90 percent of the farm land in both years. About one-fifth of the land in Arizona was held by individuals, the lowest proportion of any State.

Significant increases in individual ownership occurred in the West North Central States in the 5 years. This is accounted for by the disposal of lands held by loan and investment

companies and of tax-reverted lands acquired before 1945 by State and local governments.

**CORPORATE OWNERSHIP**—If the name on the census questionnaire indicated that a company owned the land, ownership was classed as corporate. Corporate holdings in both 1945 and 1950 represented approximately 4.5 percent of the farm and ranch land of the country. They were most prevalent in the Western States and in Florida. Hired managers operated much of this land, especially that used for ranching or for production of fruits and vegetables.

Corporate holdings declined appreciably in some States during the 5 years. The decline was pronounced in the West North Central States, particularly in North Dakota and South Dakota, owing to the liquidation of holdings acquired by loan and investment companies through forfeiture and foreclosure during the depression of the 1930's. Corporations in the 1930's, for example, held 12 percent of the farm land of Iowa and North Dakota.<sup>4</sup> In many States, legislation which limited the time that corporations can hold land or the acreage they can hold forced some loan and investment companies to dispose of their lands. However, rising land values were a more significant influence in the decline in holdings of this type of corporation.<sup>5</sup> By 1950, loan and investment corporations owned only 0.2 percent of the farm land in the country.

Farming and ranching companies owned 2.2 percent of the farm land in 1950. The holdings of this type of corporation appear to be on the increase, particularly in Florida and California. In these States large acreages are devoted to the production of fruits, vegetables, cotton, sugarcane, and grazing. Ranching companies are prevalent throughout the 17 Western States and Florida. Other profit corporations, such as real estate, timber, mineral, and railroad companies, owned almost 2 percent of the farm

<sup>4</sup> WILNER, STANLEY, and SCHAFFER, RAYMOND L. STATISTICAL ANALYSIS OF LAND OWNERSHIP IN NORTH DAKOTA IN 1925. N. Dak. Agr. Expt. Sta. March 1939. MURRAY, WILLIAM G. CORPORATE LAND, FORECLOSURES, MORTGAGE DEBT AND LAND VALUES, IOWA, 1939. Iowa Agr. Expt. Sta. Res. Bul. 266. 1939.

<sup>5</sup> TIMMONS, JOHN F., and BARLOWE, RALEIGH. FARM OWNERSHIP IN THE MIDWEST. Iowa Agr. Expt. Sta. Res. Bul. 361. June 1949.

and ranch land. They seldom farm the land they own; they usually lease it out for farming and ranching.

In the Eastern States, most of the relatively small acreage of corporate land in farms is held by industrial companies. They may hold the land for the minerals, timber, plant sites, or for other reasons. Few of these companies attempt to farm or graze their land.

INDIAN LANDS.—The acreage of farm land under Indian ownership represents Indian

reservation lands under Federal jurisdiction. State Indian reservation lands are included under State ownership. For 1950, lands owned by Indians include both tribal lands and lands under individual allotment. For 1945, lands allotted to individual Indians and so reported to census enumerators were classified as individually owned.

In both 1950 and 1945 most of the Indian-operated lands—about 90 percent in 1950—were reported to the census in the name of coopera-

TABLE 1.—All land in farms and percentage distribution by type of owner, by States, 1950

State, division, and region	All land in farms	Type of owner						
		Individual, partnership, and estate	Corporation	Indian <sup>1</sup>	Public			
					Federal	State and local	Total	
	<i>1,000 acres</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	
Maine.....	4,182	99.3	0.5				0.2	0.2
New Hampshire.....	1,714	98.6	.6		0.1		.7	.8
Vermont.....	3,527	99.0	.7				.3	.3
Massachusetts.....	1,660	95.2	3.8		.1		.9	1.0
Rhode Island.....	191	93.7	5.2				1.1	1.1
Connecticut.....	1,272	95.8	3.1		.2		.9	1.1
New England.....	12,546	98.1	1.4		<sup>2</sup>		.5	
New York.....	16,017	98.9	.8				.3	.3
New Jersey.....	1,725	95.3	4.2				.5	.5
Pennsylvania.....	14,113	98.2	1.2		.3		.3	.6
Middle Atlantic.....	31,855	98.4	1.2		.1		.3	.4
Ohio.....	20,969	99.1	.5		.2		.2	.4
Indiana.....	19,659	98.6	1.0		<sup>2</sup>		.4	.4
Illinois.....	30,979	98.5	1.2		.1		.2	.3
Michigan.....	17,270	99.0	.6		.1		.3	.4
Wisconsin.....	23,221	98.9	.9	<sup>2</sup>	.1		.1	.2
East North Central.....	112,098	98.8	.9	<sup>2</sup>	.1		.2	.3
Minnesota.....	32,883	99.0	.8		<sup>2</sup>		.2	.2
Iowa.....	34,265	99.1	.7				.2	.2
Missouri.....	35,123	98.9	.7		.3		.1	.4
North Dakota.....	41,194	93.9	1.2	1.3	1.1		2.5	3.6
South Dakota.....	44,786	85.1	1.2	7.4	2.0		4.3	6.3
Nebraska.....	47,467	94.7	2.6	.2	.5		2.0	2.5
Kansas.....	48,611	98.7	1.1	<sup>2</sup>	.1		.1	.2
West North Central.....	284,329	95.3	1.2	1.4	.6		1.5	2.1
Delaware.....	851	97.9	2.0		.1			.1
Maryland.....	4,056	97.8	1.9				.3	.3
District of Columbia.....	1				100.0			100.0
Virginia.....	15,572	98.8	.8		<sup>2</sup>		.4	.4
West Virginia.....	8,215	98.7	1.3					
North Carolina.....	19,318	99.2	.5	.1	<sup>2</sup>		.2	.2
South Carolina.....	11,879	97.4	2.2		.1		.3	.4
Georgia.....	25,751	97.1	2.5		.2		.2	.4
Florida.....	16,528	82.1	14.5	.5	1.1		1.8	2.9
South Atlantic.....	102,171	95.5	3.6	.1	.3		.5	.8

Continued



TABLE 1.—All land in farms and percentage distribution by type of owner, by States, 1950  
—Continued

State, division, and region	All land in farms	Type of owner					
		Individual, partner- ship, and estate	Corpora- tion	Indian <sup>1</sup>	Public		
					Federal	State and local	Total
	1,000 acres	Percent	Percent	Percent	Percent	Percent	Percent
Kentucky	19,442	99.0	.4		.5	.1	.6
Tennessee	18,534	98.9	.6		.3	.2	.5
Alabama	20,889	98.0	1.2		.3	.5	.8
Mississippi	20,711	97.6	1.4		.2	.8	1.0
East South Central	79,576	98.4	.9		.3	.4	.7
Arkansas	18,871	98.1	1.4		.2	.3	.5
Louisiana	11,202	91.8	7.2		.2	1.0	1.0
Oklahoma	36,007	95.5	.9	1.2	.5	1.9	2.4
Texas	145,389	90.7	6.8		.4	2.1	2.5
West South Central	211,469	92.3	5.3	.2	.4	1.8	2.2
Montana	59,247	76.7	6.1	7.9	3.2	6.1	9.3
Idaho	13,224	86.2	2.4	2.2	1.8	7.4	9.2
Wyoming	34,421	62.4	15.0	6.7	7.9	8.0	15.9
Colorado	37,953	85.1	6.2	2.2	1.4	5.1	6.5
New Mexico	47,522	56.6	8.7	14.0	6.5	14.2	20.7
Arizona	39,916	20.6	10.4	49.7	5.7	13.6	19.3
Utah	10,865	71.0	13.8	7.0	.5	7.7	8.2
Nevada	7,064	52.8	32.8	13.3	.6	.5	1.1
Mountain	250,212	62.8	9.4	14.5	4.3	9.0	13.3
Washington	17,369	89.1	4.3	1.3	2.6	2.7	5.3
Oregon	20,328	90.3	5.6	1.1	1.5	1.5	3.0
California	36,613	83.7	11.8	.5	2.6	1.4	4.0
Pacific	74,310	86.8	8.3	.9	2.3	1.7	4.0
East	470,590	97.8	1.7	<sup>2</sup>	.2	.3	.5
West <sup>3</sup>	687,976	81.1	6.2	6.0	2.2	4.5	6.7
United States	1,158,566	87.8	4.4	3.6	1.4	2.8	4.2

<sup>1</sup> Indian lands under Federal jurisdiction

<sup>2</sup> Less than 0.05 percent.

<sup>3</sup> North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, and California.

tive groups. In some instances an entire reservation was reported as one farm. Indian land is used by the tribes or leased, primarily for grazing. Large tracts of Indian reservation lands reported as not used for crops or grazing were not included by the census as land in farms. Farm lands operated by Indians, either individuals or tribal groups, amounted to 36 million acres in 1950, according to the census. In addition to land owned and operated by Indians this included land rented by Indians from others. The total farm land owned by Indians in 1950, as estimated in this study, amounted to approximately 41 million acres. Thus, a

minimum of 5 million acres of Indian-owned land was in farms of non-Indians.

The increase in the proportion of farm land owned by Indians from 1945 to 1950 reflects an increase of 6 million acres of Indian-owned land in farms. Most of the increase was in Arizona, Montana, New Mexico, South Dakota, Utah, and Wyoming. Some of it was due to differences in classification but most of it represents increases in the acreage reported to the census. Not all of the increase in acreage represents increase in agricultural use of the land. Most of it was reported to the census in 1949 as land pastured or grazed. Much of this land,

however, has a very low carrying capacity and may not have been reported in 1945. Although census enumerators in 1945 were instructed to include "unfenced grazing land over which reservation livestock is herded," they were told not to include "any vast acreage of wild land not utilized to any appreciable extent."

**PUBLIC OWNERSHIP.**—Publicly owned lands in 1950, comprising Federal, State, and local government holdings, represented more than 4 percent of the land in farms. Neither the large acreages of public land grazed under permit nor lands not used for agriculture were enumerated by the census as land in farms.

TABLE 2.—All land in farms and percentage distribution by type of owner, by States, 1945<sup>1</sup>

State, division, and region	All land in farms 1,000 acres	Type of owner			
		Individual, partnership, and estate	Corporation	Indian	Public
		Percent	Percent	Percent	Percent
Maine	4,613	98.7	0.5		
New Hampshire	2,017	99.0	1.0		0.8
Vermont	3,931	99.2	.8		
Massachusetts	2,078	98.6	1.2		.2
Rhode Island	265	89.7	6.3		4.0
Connecticut <sup>3</sup>	1,593	98.1	1.7		.2
New England	14,497	98.6	1.0		.4
New York <sup>3</sup>	17,568	96.0	3.9		.1
New Jersey	1,818	96.2	3.0		.8
Pennsylvania	15,020	98.7	1.0		.3
Middle Atlantic	34,406	97.2	2.6		.1
Ohio	21,928	98.9	.5		.6
Indiana	20,027	98.6	.5		.9
Illinois	31,602	98.5	1.4		.1
Michigan	18,392	99.5	.4		.1
Wisconsin	23,615	98.0	1.5		.5
East North Central	115,564	98.7	.9		.4
Minnesota	33,140	97.3	2.0		.7
Iowa	34,454	97.9	1.9		.2
Missouri	35,278	98.6	1.2		.2
North Dakota	41,001	89.3	4.1	0.8	5.8
South Dakota	43,032	75.0	4.0	6.3	14.7
Nebraska	47,753	95.4	2.3	.1	2.2
Kansas	48,589	97.9	2.0		.1
West North Central	283,247	92.8	2.5	1.1	3.6
Delaware	923	98.8	.9		.3
Maryland	4,200	98.5	.8		.7
District of Columbia	2	23.4			76.6
Virginia	16,358	99.7			.2
West Virginia	8,720	96.9	2.6		.5
North Carolina	18,618	98.9	1.0		.1
South Carolina <sup>3</sup>	11,022	96.3	2.2		1.5
Georgia	23,676	95.7	3.9		.4
Florida	13,083	89.2	10.6		.2
South Atlantic	96,602	96.4	3.2		.4

Continued

TABLE 2.—All land in farms and percentage distribution by type of owner, by States, 1945<sup>1</sup>  
Continued

State, division, and region	All land in farms	Type of owner			
		Individual, partnership, and estate	Corporation	Indian	Public
	1,000 acres	Percent	Percent	Percent	Percent
Kentucky.....	19,725	98.1	1.4		.5
Tennessee.....	17,789	99.5	.4		.1
Alabama.....	19,068	99.2	.5		.3
Mississippi.....	19,617	98.5	1.2		.3
East South Central.....	76,199	98.8	.9		.3
Arkansas.....	17,456	97.7	2.0		.3
Louisiana.....	10,040	93.5	6.3		.2
Oklahoma.....	36,162	94.1	.8	1.9	3.2
Texas <sup>3</sup> .....	141,338	90.8	7.8		1.4
West South Central.....	204,996	92.1	6.0	.3	1.6
Montana.....	58,787	76.8	6.9	6.1	10.2
Idaho.....	12,503	90.0	1.0	3.6	5.4
Wyoming.....	33,117	68.7	13.6	3.7	14.0
Colorado.....	36,218	88.1	4.2	1.8	5.9
New Mexico.....	49,608	51.2	7.7	11.7	29.4
Arizona.....	37,856	23.7	13.2	47.1	16.0
Utah.....	10,309	80.7	8.3	3.3	7.7
Nevada.....	6,178	52.7	31.0	15.1	1.2
Mountain.....	244,576	64.2	8.9	12.6	14.3
Washington.....	16,720	90.0	3.8	1.5	4.7
Oregon.....	19,754	89.8	6.9	.2	3.1
California.....	35,054	92.1	5.6	.4	1.9
Pacific.....	71,528	91.0	5.5	.6	2.9
East.....	467,636	97.9	1.8		.3
West <sup>4</sup> .....	673,979	80.8	6.4	5.3	7.5
United States.....	1,141,615	87.9	4.5	3.1	4.5

<sup>1</sup> Indian lands under Federal jurisdiction.

<sup>2</sup> Less than 0.05 percent.

<sup>3</sup> Ownership data revised.

<sup>4</sup> North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, and California.

Most publicly owned lands in farms are unappropriated Federal, State grant, and tax-reverted State and county lands. Approximately 95 percent of these publicly owned lands are in the 17 Western States, where they are used principally for grazing because rainfall limits their use for crop production. In 1950, a third of these public lands in farms were owned by the Federal Government, and two-thirds by State and local governments.

Declines in the acreage of publicly owned land in farms occurred almost entirely in North Dakota, South Dakota, and New Mexico. In the Dakotas, large acreages of tax-forfeited lands were returned to the tax rolls as they reverted from State to private ownership.

In New Mexico, publicly owned land in farms declined from 29.4 to 20.7 percent, or approximately 4.7 million acres, owing primarily to differences in reporting such lands to the



census. Some misunderstanding may have arisen because of confusion as to the distinction between leased and permit grazing land. Lands leased for grazing were to be included; lands grazed under permit were not to be included.

Some of the increase in publicly owned land in farms in the Western States resulted from the addition of 1.7 million acres of land administered under the Taylor Grazing Act and leased for grazing between 1945 and 1950.<sup>6</sup>

There was a slight increase in the acreage and percentage of land in public ownership in the 31 Eastern States, the result, apparently, of additional leasing of publicly owned lands, such as military reservations, for farming and grazing. This increase, combined with the decline in acreage of privately owned land, raised the proportion of land in public ownership.

<sup>6</sup> From reports of the Secretary of Interior for 1945 and 1950.

A mimeographed index for volume 5 is  
now available upon request