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Approaches to Defining and Classifying Farms

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APPROACHES TO
DEFINING AND CLASSIFYING FARMS

by

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PANEL 1:
ABSTRACT AND PURPOSE

Abstract

Alternatives to the value of sales of agricultural products as a major determinant in defining and classifying farms are proposed. Problems in understanding the changing structure of U.S. agriculture in the past 30 years result from: (1) rapid changes in the levels of agricultural prices, (2) the adoption of new technology, and (3) the increased availability and use of off-farm jobs by members of farm operator families. It is suggested that our national statistics classify farms into three major categories: FULL-TIME, PART-TIME, and RESIDENTIAL. A shift away from value of sales as the major classifier of size distributions is encouraged. Labor used in agricultural production and standardized estimates of value added for each acre of crops or livestock unit are proposed to define and classify farms.

Purposes of Presentation

1. Show the difficulty of interpreting changes in the size distribution of farms in the past 20 years (Panel 1).

2. Examine past economic classifications of farms used by Census in 1950 and 1969 for criteria and major groupings (Panel 2).

3. Consider alternatives to "farms" as the basic unit of account; encourage use of the "establishment" and "company" in collection of data as used in Census of Manufacturers (Panel 2).

4. Consider and evaluate criteria for the classification of farms or establishments other than value of sales (Panel 3).

5. Demonstrate how the EC classifies farms using the European Size Unit (ESU). Give example of possible procedure in the U.S. (Panel 3).

6. Review alternative ways in which farms may be classified using Ahearn and Lee's methodology and analysis and labor-based distributions (Panel 4).

7. Draw conclusions about needed actions (Panel 4).

Interpreting Changes in Size Distributions Based On Value Of Sales Is Difficult 1969-1978

MAJOR PROBLEMS:

1. Changing Prices of Agricultural Products -- Prices almost doubled between 1969 and 1978.

2. Increased Output per Cropland Acre and Livestock Unit Due to Adoption of New Technology -- The combination of increased prices and technical efficiency meant that one agricultural worker in 1978 produced more than double the sales of a similar worker in 1969.

3. Both Opportunities and Use of Off-farm Jobs Have Increased -- The part-time farming sector has increased adding to the complexity of interpreting statistics.

Table 1. DISTRIBUTION OF FARM NUMBERS BY SALES CLASS
Census of Agriculture, 1969 and 1978

Description	1969	1969 Adjusted 1978 base	1978
Producer Price Index Farm Products (1967=100)	109.1		212.5
Prices Received by Farmers (1977=100)	59		115
Value of Farm Products Sold		thousands of farms	
$500,000 or more	4	12	18
200,000 - 499,999	13	40	63
100,000 - 199,999	35	104	141
40,000 - 99,999	170	397	360
20,000 - 39,999	331	395	299
10,000 - 19,999	395	390	299
5,000 - 9,999	390	358	314
2,500 - 4,999	395	339	301
Under $2,500	995	347	461
Abnormal	2	2	2
Total	2,730	2,384*	2,258

* Reflects change in Census definition, $250 to $1000 sales.

Adjustment Procedures

1. Prices approximately doubled between 1969 and 1978. Thus, $10,000 - 19,999 in 1969 is considered the equivalent of $20,000 -39,999 in 1978.

2. Minimum value of sales to qualify as farm changed from $250 in 1969 to $1000 in 1978. Farms with sales below $500 dropped from adjusted total for 1969.

3. Where necessary class intervals as reported in 1969 were split proportionately to fit 1978 classes; procedures described in paper on table.

Figure 1. FARM NUMBERS BY SALES CLASS, United States, 1969 and 1978

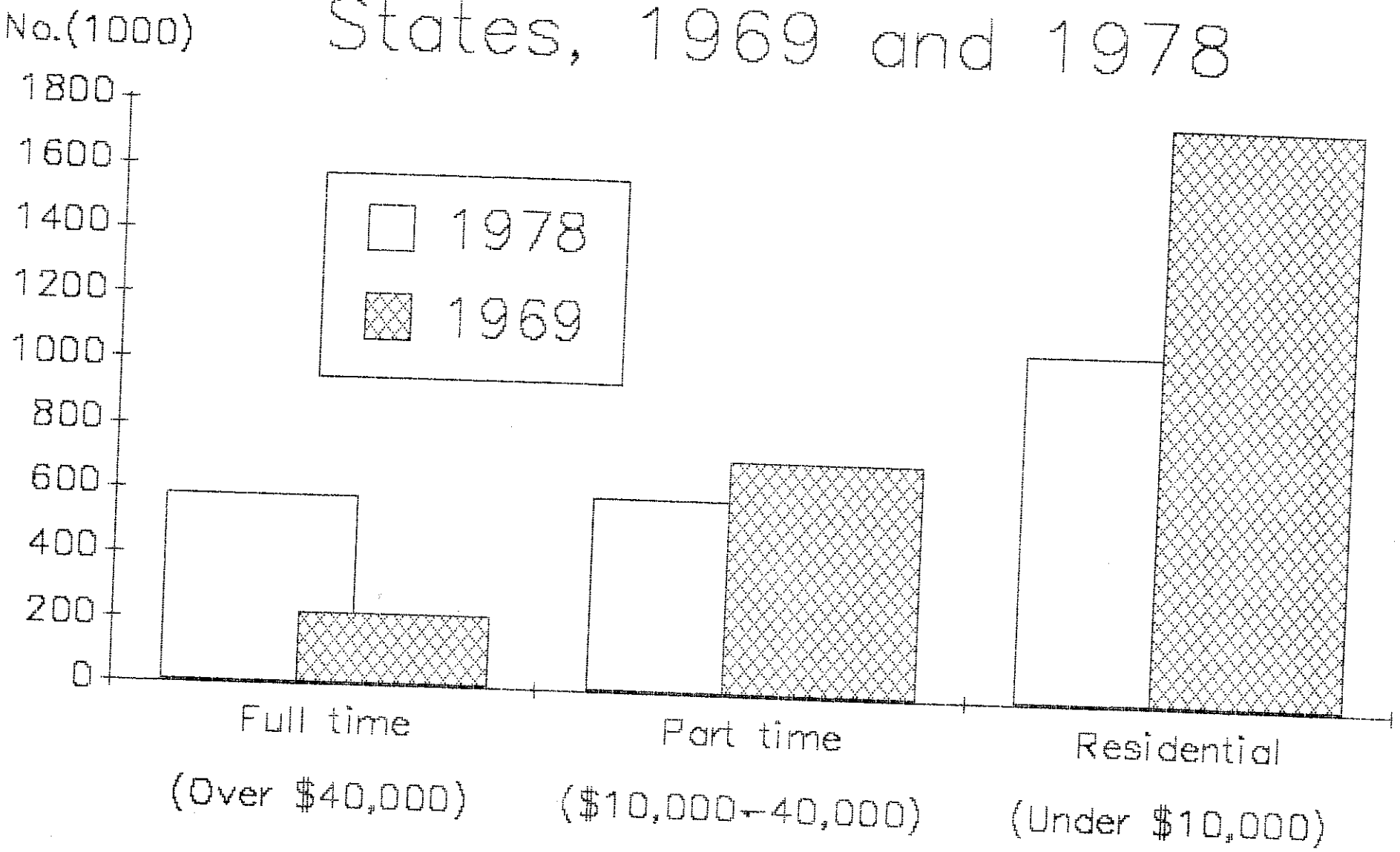
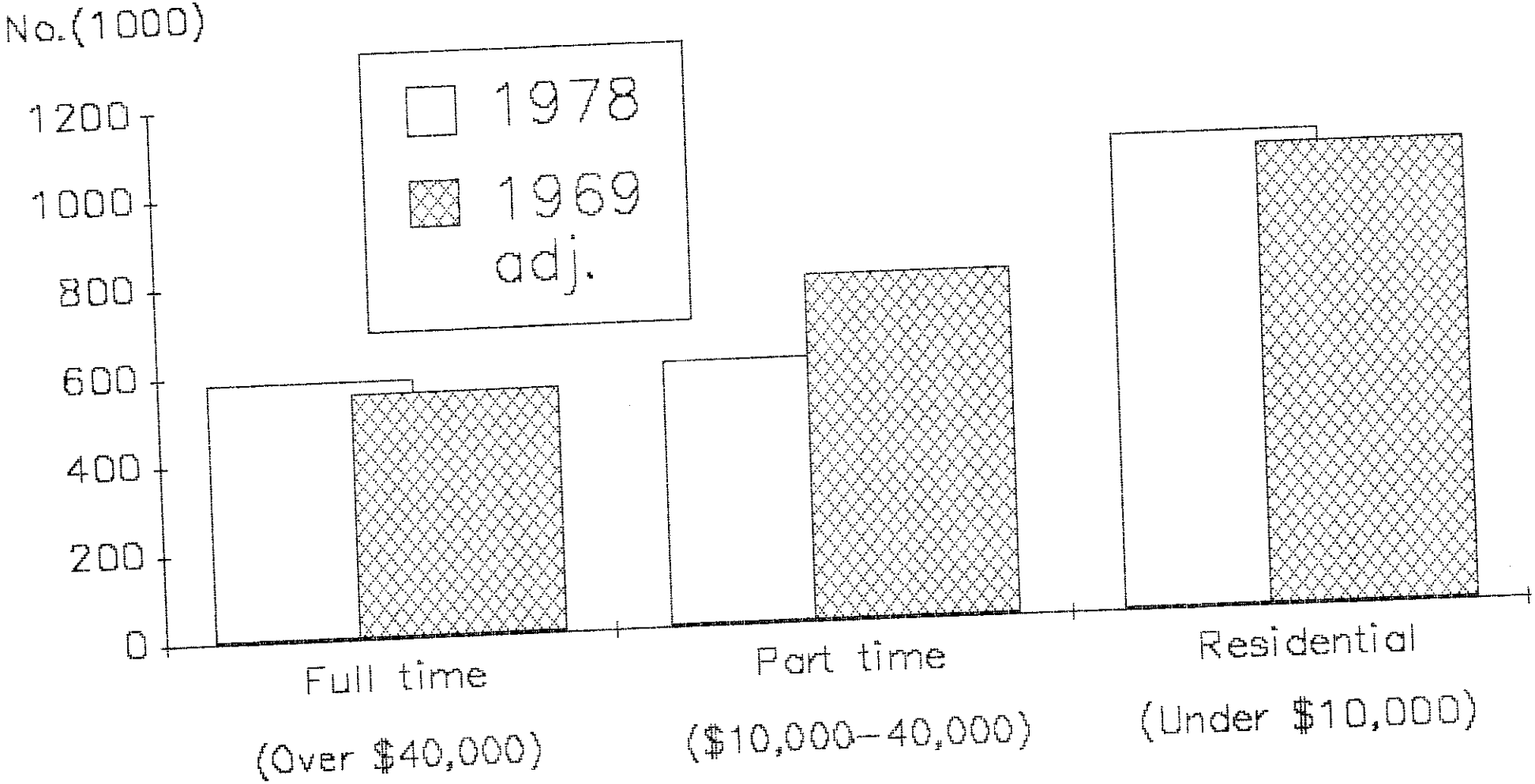


Figure 2. FARM NUMBERS BY ADJUSTED SALES CLASS, United States, 1969 and 1978



PANEL 2:

ECONOMIC CLASSIFICATION OF FARMS DEVELOPED BY CENSUS

Table 2. DISTRIBUTION OF FARMS BY ECONOMIC CLASS
Census of Agriculture, United States, 1950

Class	Criteria used: Value of farm products sold	Criteria used: Other	Number of farms
Commercial:			thousands
I	$25,000 and over		103
II	10,000 - 24,999		381
III	5,000 - 9,999		721
IV	2,500 - 4,999		883
V	1,200 - 2,499		901
VI	250 - 1,199	Less than 100 days of work off farm by operator; income from off-farm sources less than value of farm products	717
			3,706
Other:			
Part-time	$ 250 - 1,199	100 days or more of off-farm work by operator; income from off-farm sources greater than value of farm products	639
Residential	Less than $250	None	1,030
Abnormal		Institutional and experimental farms, etc.	4
Total number			5,379

Source: U.S. Census of Agriculture, Volume II, 1950, pp. 1109-10.

Table 3. DISTRIBUTION OF FARMS BY ECONOMIC CLASS
Census of Agriculture, United States, 1969

Class	Criteria used: Value of farm products sold	Criteria used: Other	Number of farms
			thousands
1	$40,000 and over	None	222
2	20,000 - 39,999	None	331
3	10,000 - 19,999	None	395
4	5,000 - 9,999	None	390
5	2,500 - 4,999	Less than $2,500 sales if normally would have had sales in excess of $2,500 (crop failure, new farms, large inventories).	395
6	50 - 2,499	Operator under 65 years of age and did not work off-farm more than 100 days.	193
Part-time	50 - 2,499	Operator under 65 years, worked off-farm more than 100 days.	575
Part retirement	50 - 2,499	Operator who is over 65 years of age.	227
Abnormal		Institutional and experimental farms, etc.	2
Total number			2,730

Source: U.S. Census of Agriculture, 1969, Vol. II, Chapter 7, p. 7.

CRITERIA USED FOR ECONOMIC CLASSES:

1. Value of farm products sold (1950-1969); shift upward in value of sales for Class I from $25,000 to $40,000 in 1959 and similar shifts for other classes

2. Days of work off the farm by operator (1950-1969)

3. Age of operator, under and over 65 (1959-1969)

4. Income of family members from off-farm earnings larger than value of farm products sold (1950-1959)

MAJOR DIVISIONS:

1. Commercial -- divided into 6 groups based on sales

2. Part-time

3. Part retirement

4. Residential

5. Abnormal

COMMENT:

For the 1974 Census designation of Economic Classes was discontinued. A major consideration was the rapid changes in prices and the difficulty of making valid comparisons between Census years for the same classes. Size distributions based on value of sales were continued. Designations such as "commercial," "part time," and "residential" were lost.

FARM DEFINITION AND THE BASIC UNIT OF ACCOUNT

Current Definition of a Farm -- Established in 1974 -- Nine changes in definition since 1850:

> "A farm is defined to include all land on which agricultural operations were conducted at any time during a given year under the day-to-day control of an individual management, and from which $1000 or more of agricultural products were sold or normally would have been sold during the year."

Key Elements of the Definition:

1. All land operated as a unit, whether owned or rented.
2. Business under the control of an individual management.
3. Minimum level of agricultural sales, currently $1000, under normal conditions.
4. In most earlier definitions, there was also a minimum number of acres operated.

UNIT OF ACCOUNT FOR CENSUS OF MANUFACTURES:

1. Establishment -- "An establishment is defined as a single physical location where manufacturing is performed by one employee or more."

2. Company -- "A company is defined as a business organization consisting of one establishment or more under common ownership or control."

3. One argument for moving the Census of Agriculture to cover years ending in 2 and 7 was to conform and coordinate accounts with the Census of Manufacturers.

4. In 1974, Carlin and Handy made the case in the AJAE for a shift where, "... Establishments would be the basic unit of account. Firms would be composed of one or more establishments." (p. 969, December 1974).

Census now counts each operating unit with a separate manager as one farm even though as many as 20 or more such units are centrally owned and controlled by a corporate entity. In contrast, a partnership involving a father and two sons living at three locations with what were once three different farms, is counted as one farm and treated as one economic entity even though production may in fact occur in three different "plants" with one employee or more on each.

PANEL 3:

CRITERIA FOR CLASSIFICATION OF FARMS OR ESTABLISHMENTS BY SIZE

Problems With Value of Sales as a Criterion

1. Sales may be a poor indicator of the Value of Production

   (a) Only part of one year's crop or two year's crops may be sold in any given year.

   (b) Important changes in livestock or crop inventories are not reflected in the value of sales.

2. The effects of changing price levels are not easily accounted for in comparisons between years.

3. Sales do not include Government Payments which reflect returns or rent for the use of idled resources.

4. Bad years or losses of crops and livestock are not recognized even though inputs are large.

Alternative Methods of Determining Size of Business

VALUE MEASURES:

1. Value of Production -- A procedure to adjust for inventory changes is required in asking questions about sales, growth, livestock numbers, and crops in storage.

2. Value of Production or Cash Purchases Adjusted for Inventories Whichever is Larger -- This provides for an alternative estimate of size when production losses are a factor. Value of inputs in such a case more accurately reflects the scope of operations than does sales or value of production.

3. Value Added from Production -- Some enterprises are heavily dependent on purchased inputs and the percentage of sales which in value added is small; broiler meat and eggs are good examples. In other cases, value added is a large proportion of sales; cow-calf and many vegetable crops are examples.

4. Standardized Measures Based on Value Added Concepts -- A set of measures similar to an earlier concept, productive man work units, but based on an approximation of value added for each enterprise instead of labor. See SGM below.

PHYSICAL MEASURES:

1. Inputs of Labor -- Labor measured in months or years is the most basic and limiting resource in most agricultural enterprises and a common denominator. It is most useful in making comparisons for similar enterprises. The problem of how to handle piece work or contract labor is a continuing measurement issue.

2. Acres of Farmland or Cropland -- This is the most widely reported measure of size throughout the world. For a given type of farm it is useful but not appropriate as a single classifier for both crops and livestock on a national basis.

STANDARDIZED SIZE UNITS LIKE EUROPEAN SIZE UNITS

History -- The European Community established a Farm Accountancy Data Network to provide information on incomes and business operations of agricultural holdings starting in 1965. A system of estimating Standard Gross Margins for each productive agricultural enterprise was established in order to classify farms into meaningful groups by size.

The European Size Unit (ESU) is an outgrowth of the EC's effort to find a common denominator to classify farms by size over time. It is defined as 1000 ECU's of Standard Gross Margin (SGM) for the 1980 reference period. As prices change, the base unit for one ESU is increased by the rate of change in prices. If prices increased 20% over the 1980 reference period, then one ESU = 1200 ECU (the European Currency Unit based on a bundle of EC currencies).

Economic Size Classes of Holdings -- 1985

Class	Interval of ESU
I	less than 2
II	2 to 3.99
III	4 to 5.99
IV	6 to 7.99
V	8 to 11.99
VI	12 to 15.99
VII	16 to 39.99
VIII	40 to 99.99
IX	100 or more

CALCULATION OF STANDARD GROSS MARGIN

Responsibility for calculation of SGM for individual enterprises is placed on the Ministry of Agriculture in each of the 12 member countries. The number of standard enterprises and the detail of differences between different producing regions within a country is also a national decision, while the basic definitions and procedures for calculation are mandated by the Community.

The Standard Gross Margin means the value of gross margin corresponding to the average situation in a given region for each agricultural characteristic. The following specific costs are deducted from the value of gross production:

Crops:
- Seeds and seedlings
- Fertilizers
- Crop protection products
- Other variable costs including water for irrigation, heating, drying, marketing and processing costs

Livestock:
- Feeding stuffs
- Livestock replacement animals
- Other variable costs including veterinary fees, artificial insemination, performance testing, marketing and processing costs

Specific costs not to be deducted include labor, machinery, buildings, fuel and lubricants, maintenance and depreciation. All SGMs correspond to a production period of 12 months.

EXAMPLES OF SGM FOR THE UNITED STATES CALCULATED FROM ERS COST OF PRODUCTION DATA 1986

Description	Fed Cattle U.S., All sizes	Cow-Calf U.S., per cow
Cash receipts	$58.38/cwt.	$262.48
Variable costs	52.07	127.80
SGM equivalent	6.31	134.68
SGM as % Receipts	10.8%	51.3%

Note the difference in "value added" in these two enterprises using this standardized procedure which is the basis of EC calculation of European Size Units (ESU).

PANEL 4:
BASIC DIVISIONS IN CLASSIFYING FARMS

Economic Classes Based on Labor Used in Agricultural Production

FULL-TIME (Commercial) -- Establishment where agricultural production and marketing is the primary occupation of the operator (manager), where 12 months or more of operator, family or regular hired labor are employed.

PART-TIME (Commercial) -- Establishment where agricultural production is an important contributor to family income and where 2 to 12 months of operator, family or regular hired labor in total are employed. (Piece work and contract labor are not included in the totals for labor in this definition.)

RESIDENTIAL -- Establishment where agricultural production occurs but is not an important contributor to family income; less than two months of operator, family or regular hired labor are employed in agricultural production and marketing.

COMMENT:

One approach to a consistent classification in terms of labor requirements is to establish standard labor use for individual crop and livestock enterprises. In this manner, a listing of the acres of crops and number of animal units on each establishment could determine appropriate classification in standard units. Labor data from the ERS's "Cost of Production" series could serve as a basis for these standards.

AHEARN-LEE PROPOSAL (1988): INCOME SOURCE AND MAJOR OCCUPATION OF OPERATOR

1. Operator's major occupation is not farming and household not dependent on farm income.
   - about 1/3 of FCRS farms currently
   - probably 40-50 percent of US farms
   - 6% of US agricultural production
   - lowest poverty rate of 4 groups

2. Operator's major occupation is not farming but the household is dependent on farm income.
   - small group; 4% of all farms
   - operators of cash grain farms + off-farm job
   - small livestock farms + low paying off-farm job

3. Operator's major occupation is farming but household not dependent on farm income.
   - about 25% of FCRS households
   - 12% of US production
   - half specialize in livestock production
   - includes many near or in retirement
   - highest poverty rate of 4 groups

4. Operator's major occupation is farming and household is dependent on farm income.
   - nearly 40% of FCRS farms
   - 75% of US agricultural production
   - mid size and large farms in terms of sales
   - second lowest poverty rate of 4 groups

COMMENT:

The Ahearn-Lee classification system and the Labor-Based system proposed have great overlap in concept and numbers of farms. Class 1 and Residential are essentially the same; Classes 2 and 3 are primarily Part-Time farms; Class 4 includes almost all of the Full-Time Commercial farms. "Establishment" or "Farm" in the definitions have the same general meaning.

CONCLUSIONS

1. The basic unit of account should continue to be FARMS, the basic "establishments" of production agriculture. In addition, reporting for "companies" should be made when more than one establishment is operated under common ownership or control.

2. A new definition for a FARM or ESTABLISHMENT should be agreed upon before the 1992 Census by USDA in cooperation with other federal agencies. One proposal is the following: "An operation under the control of one individual or group where agricultural products are sold (no minimum amount) from production on that site and where two weeks or more of operator, family or hired labor is employed in that production." Ramifications of different alternatives should be studied carefully.

3. A generic division of farms into three major groups is proposed: (1) FULL-TIME, (2) PART-TIME, and (3) RESIDENTIAL. These follow Hurley's census classifications, 1950-69.

4. Definitions for the major divisions should be based on either physical criteria, like months of labor employed, or on some standardized measure which can be adjusted for changes in prices over time.

5. Classification of farms on the basis of "value of products sold" should be converted to a "value of production" base.

6. Further study and experimentation with measures like the European Size Unit (ESU) based on Standard Gross Margin (SGM) or another Value Added measure is encouraged.

7. Integration of data and information from the Census of Agriculture and Census of Manufactures for sectors like poultry meat, eggs, and fed cattle deserves high priority and special studies for the 1992 Census.

8. A program to obtain information about the use of agricultural land and natural resources held by individuals and corporations, who are not farm operators, should be developed and carried out on a regular basis with sample surveys.