# Economic Analysis of The State Institutional Farm System

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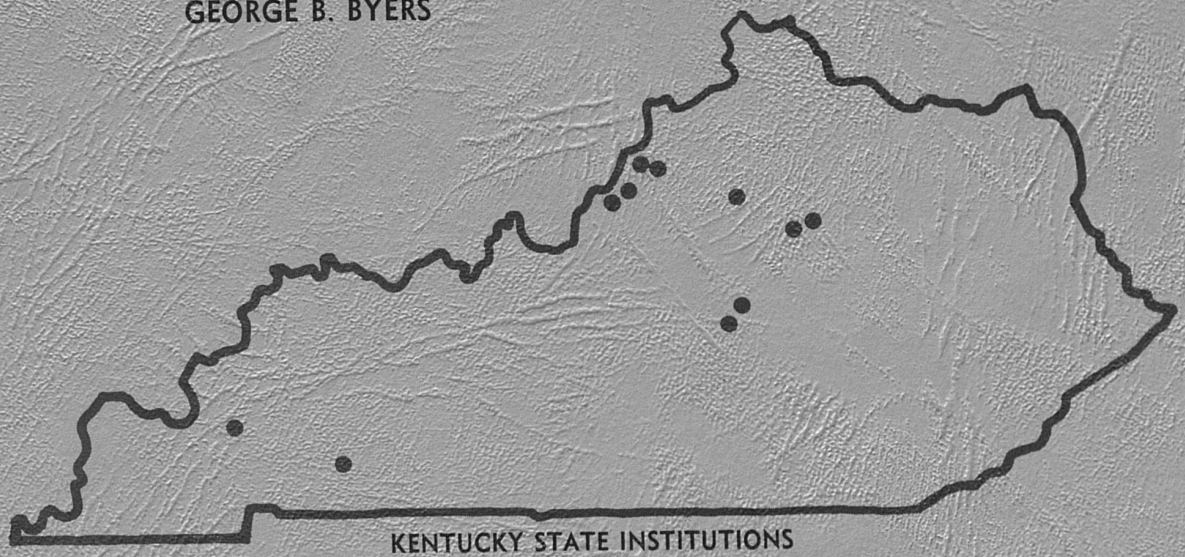

KENTUCKY STATE INSTITUTIONS

UNIVERSITY OF KENTUCKY
AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF AGRICULTURAL ECONOMICS
LEXINGTON

*Under Contract With*
Department of Finance,
Commonwealth of Kentucky
*Through*
The Division of Farm Management

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# ECONOMIC ANALYSIS OF THE STATE INSTITUTIONAL FARM SYSTEM

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# PREFACE

The research reported on in this Progress Report was financed by funds from a contract with the Division of Farm Management of the state government of Kentucky. The study is economic in character, with the primary objective being a comprehensive plan for the operation of the 11 institutional farms at a minimum cost for the whole system. Information as to food needs at the institutions was furnished by the Division of Farm Management. In addition, certain information as to the use of parts of the farms for therapeutic or rehabilitation purposes was also provided by that Division from data obtained by them. This latter information, while limited, became a part of the linear program.

The plan herein developed becomes a base or master plan from which adjustments can be made as new factors develop. It also can be adjusted to conform with decisions relating to therapeutic or rehabilitation policies.

Centralization of competent management is essential to successful economic implementation of the reorganizational program proposed in this report. Authority and responsibility at the state level, throughout the farm system, to supervise and direct overall farm operations are especially important if the objective is to attain the lowest cost combination of enterprises.

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# SUMMARY

The study reported here was an economic analysis of institutional farms in Kentucky, made under contract with the Department of Finance, Commonwealth of Kentucky through the Division of Farm Management. The objective of the study was to determine how state-controlled land, labor, capital and management resources associated with mental, correctional and child care institutions can best be used within specified limits to provide each institution in the system its required amount of each food category at the least possible total cost to the Commonwealth. The principal tool used in this analysis was linear programming.

The 11 institutions included in this study have associated with them nearly 8,000 acres of farm land, varying amounts of patient, inmate and retardate labor, and a considerable investment in buildings and agricultural equipment which can produce much of the food products required by some 15,000 individuals in these institutions. Currently, these food-producing resources are directed primarily toward food production for the institution at which the resources are located.

The main feature of the minimum cost food production program outlined in this report is that farms would specialize in the production of foods to which their resources are best suited and receive the remainder of their food requirements from other institutions. Although specialization would require that products and some resources be mobile, resulting in some transportation costs, these would be more than offset by decreased cost of food production.

The largest farm operation would be located at the Kentucky State Reformatory and the Kentucky State Penitentiary at Eddyville. These two farms would produce milk for their own institutional needs and for those of six other institutions. They would also produce feeder pigs, many of which would be moved to other institutional farms so that the garbage available there could be used in the fattening process. In addition, the Reformatory farm would produce eggs for several institutions.

The mental hospital farms would be largely devoted to the production of feeder calves. These calves would be moved to the Reformatory and the Penitentiary for finishing and possibly for slaughtering.

The main advantages of this program are derived from: (1) more appropriate land use, (2) larger enterprises and lower overhead costs, and (3) fuller utilization of inmate labor at the Penitentiary and the

Reformatory. The main disadvantages are: (1) the need of transporting relatively large amounts of food, materials and animals, and (2) the possible losses due to poor management are greater than under the present decentralized system of production.

The farm program outlined in this report would produce food products valued at nearly $2 million per year at wholesale prices. Implementation of the program would require an initial capital outlay of about $1.2 million and an annual cost of slightly over $1 million to keep the program in operation.

One of the most important implications of this program is that competent and dependable management would be required throughout the farm system to supervise and direct all phases of the farm operation. At the state level it is especially important that some managerial unit have both the authority and responsibility for over-all direction of the insititutional farm program. Unless these management criteria are completely satisfied, implementation of this program might increase rather than decrease the cost of producing the required food.

# ECONOMIC ANALYSIS OF THE KENTUCKY STATE INSTITUTIONAL FARM SYSTEM

## INTRODUCTION

One of the numerous responsibilities of the Commonwealth of Kentucky is the arduous, but necessary, task of providing for approximately 15,000 unfortunate individuals of our society who are in 11 state-operated mental, correctional, and child care institutions. As a measure of the magnitude of this task, the state has an investment of approximately $75 million in facilities and requires an annual expenditure of $20 million for their operation.

No small part of this expenditure is required to provide these 15,000 patients and inmates with a daily adequate diet. Not all of these foods, however, are bought on the market. The state owns, in conjunction with the institutions, a total of nearly 8,000 acres of farm land in various-sized plots on which much of this food is produced. Table 1 shows the quantities of farm-produced foods required by all institutions along with the wholesale value of each. The total value of these foods for all institutions is almost $2 million.

TABLE I

TOTAL REQUIREMENTS OF FARM-PRODUCED FOODS, THEIR COMMERCIAL VALUE, AND PERCENTAGES CURRENTLY PRODUCED IN KENTUCKY STATE INSTITUTIONAL FARM SYSTEM

| | Quantity Required | Commercial Value | Percent Now Produced |
|---|---|---|---|
| Beef, lb. | 1,008,000 | $ 383,000 | 26 |
| Pork, lb. | 783,000 | 258,000 | 70 |
| Milk, gal. | 890,000 | 534,000 | 84 |
| Eggs, doz. | 312,000 | 109,000 | 33 |
| Fresh Fruit and Vegetables, lb. | 6,141,000 | 385,000 | 100* |
| Canned Fruits and Vegetables, gal. | 390,000 | 269,000 | 40 |
| | | $1,938,000 | |

*This refers to fresh fruits and vegetables required during the growing season.

In addition to being used for food production, the farm land surrounding the institution serves at least two other purposes. First, it provides employment for patients and inmates that is considered healthful, mentally and physically. For the mental patient this work is of definite therapeutic value, according to many physicians. For the inmate it provides gainful employment in the open and away from the prison confines. This is believed to enhance rehabilitation. Second, the institutional farms provide buffer zones around the institutions which, in many instances, are necessary because of the encroachment of expanding urban and industrial areas. This is especially true at the mental hospitals which must maintain a serene and quiet atmosphere owing to the nature of their work.

Hence, the reason for maintaining institutional farms is not solely an economic one. Rather, the production of food is a joint product along with therapeutic, rehabilitative, and other benefits from the farm. This report is concerned, however, with only economic considerations. This is not to say that other factors are ignored, but inasmuch as possible they are taken as given and act as restrictions on the economic analysis of the farms reported here. No attempt has been made to measure benefits which are not economic in nature.

## Purpose of Study

The purpose of this study is to determine how the land, labor, capital and management resources on state institutional farms can best be used within specified bounds to provide each institution in the system with its required amount of each kind of food at the least possible total cost to the Commonwealth. The problem is one of selecting, from a large but finite number of alternative food sources for each institution, that combination which costs less than any other, yet satisfies all food requirements and stays within predetermined limits of the available resources. These possible alternatives for any given institution include various ways of producing a given food product from various combinations of land, labor, and capital at the using institution, the various ways of producing it at each of the other institutions and then transporting it to the using institution, as well as that of purchasing the final food product from a commercial source.

In arriving at a solution to the problem of minimum cost food production, certain assumptions about the use of state-owned resources were made. These may or may not correspond to present conditions on the institutional farms. These assumptions are necessary conditions for the successful implementation of the least-cost institutional farm program presented later in this report. The more important of these assumptions are:

1. Level of management - The farms will be managed by people who are considerably above average in their ability to coordinate the various enterprises and to see that improved practices are used to best advantage. The salary scales used in compiling costs for supervisory labor are based on this assumption.

2. Mobility of products and resources - The resources and final products that are transportable can be moved freely among institutions, usually according to some prearranged schedule but sometimes on short notice. This means that feed, livestock and final products can be produced at one institution and consumed or utilized at another institution without undue delay or cumbersome administrative procedure. Not all resources, however, are considered mobile in this study. Some are not technically or administratively suitable for transporting.

3. Central decision-making unit - There is some central decision-making unit with the authority and ability to coordinate all farming activities in the institutional farm system. This decision-making unit would also have the responsibility for carrying out and administering the entire institutional farm program in the state. This includes the ability to, and responsibility for, transferring resources and final products among farms, as well as coordinating the decisions of individual farm managers into the objectives of the institutional farm system.

4. Labor availability - It is assumed that the farms associated with the Training Home, the Kentucky State Reformatory and Kentucky State Penitentiary can supply enough retardate and inmate labor to carry on a farm operation as intensive as the size of the farm will permit. At Kentucky Village enough labor can be made available to operate a dairy large enough to furnish the institution with milk, in addition to furnishing labor for vegetable production for fresh consumption, field crop work, and a small swine enterprise. The four mental hospitals and the Children's Home are able to furnish enough patient labor to produce their own fresh vegetables. The Women's Prison and the Kentucky School for the Deaf can furnish little or no labor.

## Source of Data

The data used in this study came from a variety of sources. The State Division of Farm Management contributed records of the farming operation including prices of purchased inputs and products. The U.S.D.A. Soil Conservation Service gave splendid cooperation in furnishing technical data on soil classification and land use possibilities as well as crop yield potentials. Input-output data for livestock enterprises were obtained from records through the Division of Farm Management and from consultations with the relevant departments in the College of Agriculture and Home Economics, University of Kentucky.

Personnel of the Soil Conservation Service made a detailed inventory of soil on each institutional farm and then classified this soil according to its most intensive use consistent with permissable annual soil loss. Table 2 shows the number of acres at each institution in each of eight categories of land use. These range from continuous row crops, the most intensive classification, to rotations of different length and to permanent pasture, the least intensive classification. Land in any category may be used for any rotation grouping which is to the right of that category in Table 2; however, the reverse is not permissable, i.e., land classified in any column may not

TABLE 2

ACRES OF LAND AT EACH STATE INSTITUTION CLASSIFIED
ACCORDING TO ITS MOST INTENSIVE ROTATION GROUP

| Farm | R | RM | RMM | RMMM | RMMMM | GMM | M (Alfalfa) | Pasture | Total |
|---|---|---|---|---|---|---|---|---|---|
| Ky. State Reformatory | 547 | 158 | 43 | | | | 1,168 | 949 | 2,865 |
| Ky. State Penitentiary (2 Farms) | 246 | 83 | 453 | | | | 236 | 619 | 1,637 |
| Central State Hospital | 70 | 124 | | | | | 225 | | 419 |
| Ky. Children's Home | 66 | | | | | | 19 | | 85 |
| Ky. State Hospital | 59 | 99 | 79 | | 53 | 35 | 222 | 759 | 1,306 |
| Ky. School for Deaf | 17 | 84 | | | | | 90 | 1 | 192 |
| Ky. Village | 95 | 23 | 23 | | | | 164 | 90 | 395 |
| Western State Hospital | 87 | 127 | 73 | | | | 122 | 326 | 735 |
| Ky. Training Home | 69 | 17 | 21 | 32 | 18 | 10 | 73 | 103 | 343 |
| TOTAL | 1,256 | 715 | 692 | 32 | 71 | 45 | 2,319 | 2,847 | 7,977 |
| Percent | 15.7 | 9.0 | 8.7 | 0.4 | 0.9 | 0.6 | 29.1 | 35.7 | 100.0 |

R - Row Crop

M - Meadow

G - Small Grain

be used for any rotation grouping to the left of that column. The total acres of all categories of land use for the institutional farm system is 7,977 acres. This is the total usable acreage in the system.

The Soil Conservation Service also furnished potential crop yields associated with each soil type found on the farms. Yields were aggregated for each category of land use listed in Table 2. For each category within each farm there is an associated yield potential for each of the major crop enterprises.

Livestock budgets were made up after reviewing actual farm records and consulting personnel of the Animal Husbandry Department, the Dairy Science Department, and the Poultry Science Department. After these budgets were compiled they were returned to these personnel for review of feed requirements and other pertinent input-output data.

Food requirements for each institution were obtained from a survey by the Division of Farm Management (see Appendix A). Each institution's dietician estimated the quantity of each food category that would be needed for the next year based on present institution populations. Estimates were made in terms of dressed or processed weight, and then these were converted to live or unprocessed weight. These estimates were then increased by 10 percent to allow for fluctuations in the food production program as well as in institutional population fluctuations.

## Methods of Analysis

Linear programming was the principal tool used in this study. This is a relatively new procedure that is being used extensively for solving problems that involve maximization or minimization and utilize scarce resources. A linear programming problem has three principal components: an objective, alternative methods or processes for reaching this objective, and restrictions, either on the resources or the products they produce.[1]

1. The objective - Typically, the objective in efficiency type problems is minimum cost or maximum income. In this study the objective is to minimize the total cost of supplying a given amount of food product to each of the 11 institutions in the state. It is necessary to be able to state this objective in mathematical language for it to be amenable to linear programming procedures.

2. Alternative methods - Once the objective is stated, it is obvious that unless there is more than one way of attaining it, there is no problem, or at least, it is a trivial one. Given several alternative methods of attaining the objective, linear programming is a powerful tool for selecting the ones most efficient. The alternative methods of reaching the objective in this study include the various methods or techniques of producing each product, the purchase of this product on the market and the transportation of this product from other farms in the system.

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[1]For a discussion on linear programming see Earl O. Heady and Wilfred Candler, Linear Programming Methods (Ames: The Iowa State College Press, 1958.)

2. Restrictions - For most planning or choice-type problems there are restrictions which set limits on the kinds of plans that can be considered. In fact, a linear programming problem does not exist unless resources are restricted or limited. The restrictions in this study reflected such things as the quantity of land at each farm, the buildings and other feed storage space, type of labor, and the quantity of each food product required at each institution.

Finally, the solution obtained from linear programming has no higher validity than the data used in the program. Though linear programming, combined with the electronic computer, is a powerful computational tool, it is not a substitute for inaccurate data.

## STATE CONTROLLED FOOD-PRODUCING RESOURCES - A DESCRIPTION

The state institutions have associated with them varying types and amounts of food-producing resources. Differences in these resources are inherent in the amounts and types of farm land, the buildings and equipment, and the amount and productivity of institutional labor. The distribution of resources among institutions influences strongly the type of food program which is best.

The institutional farm labor forces are especially important when one seeks to locate enterprises within the farm system. There is a wide range among the institutions in both the amount and productivity of labor as well as in the kinds of restrictions on the work which can be done.

Location of the state institutions is shown in Figure 1.

Kentucky Village - The Kentucky Village farm is located about four miles northwest of Lexington in the Central Bluegrass region of Kentucky. The soils on this 395-acre bluegrass farm, of which the most important series are Maury, Hampshire and Loradale, were mainly derived from limestone. These soils are high in phosphate but require some lime and potash for best crop growth.

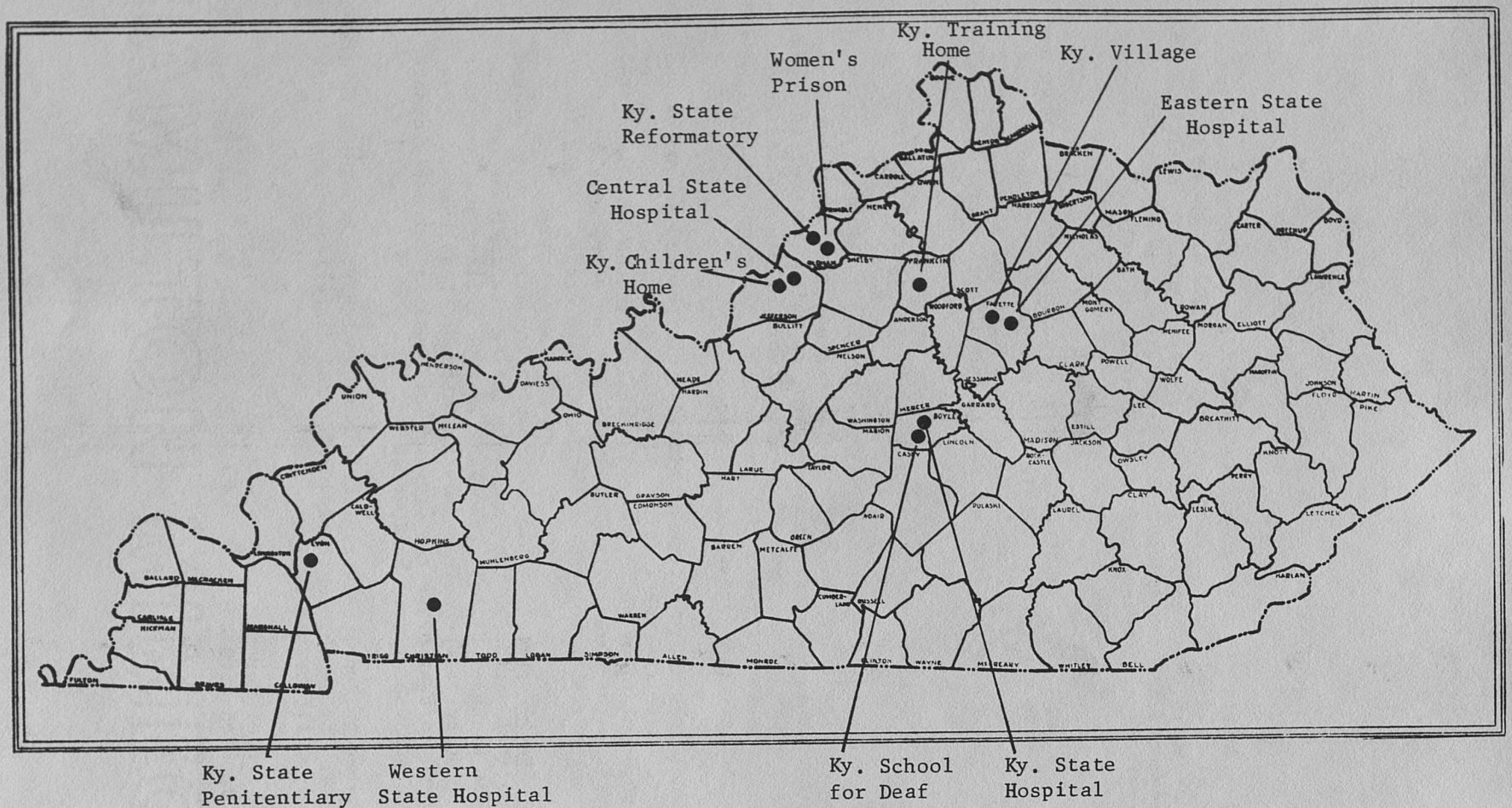
Institional labor in small quantities is furnished by juveniles who are committed to the institution. There is a fairly large turnover in inmate population causing some instability in the farm labor force. Nevertheless, the inmates furnish labor for the dairy work and for the raising of fresh vegetables and most field crops.

Kentucky State Hospital - This institution and its farm are located near Danville. Although the same soil series are dominant on this farm as at Kentucky Village, the land is more rolling and over half of the 1,306 acres are suited only to pasture. Less than 60 acres may be used in continuous-row crops. This soil is extremely drouth-sensitive because of its shallowness.

The institution supplies very little patient labor. Enough is furnished, however, for fresh vegetable production and miscellaneous jobs that require very little skill.

Kentucky School for the Deaf - The small farm of 192 acres at this school, located at Danville, also has as its most important soil series Maury, Hampshire and Loradale. No institutional labor is available.

FIGURE 1, LOCATION OF INSTITUTIONS IN KENTUCKY



Kentucky Training Home - This 343-acre farm probably has the roughest topography in the farm system. Located on the Kentucky River near Frankfort, this farm has a large variety of soil types, ranging all the way from steep upland to fertile river bottom soil. The institution furnishes more farm labor than any of the other mental hospitals. In addition, there is less turnover in patient population permitting an established and experienced farm labor force. Patient labor is available to do most of the work on this farm with close supervision.

Central State Hospital - Located at Lakeland in Jefferson County and comprising some 400 acres of cropland, this farm has as its most important soil series Pembroke, Crider and Russellville. These soils have developed in shallow loess and limestone residuum, are reddish-to-brownish colored, and are well drained and productive.

Like most other mental hospitals in the state, this institution does not furnish a large amount of farm labor. In addition to labor for fresh vegetable production, patients are available for simple jobs of a routine nature. The use of patient labor for farm work is handicapped by the increasingly high turnover in patient population.

Kentucky Children's Home - The small farm (85 acres ) associated with the Kentucky Children's Home is located at Lyndon about three miles from Central State Hospital. Consequently, its soils are quite similar to those found on the Central State Hospital farm. The Children's Home furnishes a small amount of labor which is mainly used in the production of fresh vegetables. The Kentucky State Reformatory supplies some prison labor for other enterprises on this farm.

Kentucky State Reformatory - The Reformatory farm of 2,635 acres is by far the largest farm in the system. It is located near LaGrange in the Outer Bluegrass region. A large variety of soils is found on this farm, most of which fall into two soil association areas: Pembroke-Crider-Russellville and Lowell-Shelbyville-Fairmount. About 75 percent of the land in this farm cannot be used more intensively than for pasture and meadow. Another tract of approximately 230 acres is located at the Women's Prison a few miles from the Reformatory and is operated as a part of the Reformatory farm.

A large prison labor force is available for farm work and is used extensively in the farm operation. The productivity of this labor depends to a large extent on the kind and amount of supervision given.

Western State Hospital - This Western Pennyroyal Limestone area farm is located near Hopkinsville in Christian County. Major soil series on this farm, Pembroke, Crider and Russellville, are derived mainly from loess and limestone residuum and respond well to lime and fertilizer.

About 60 percent of this farm is suited only for pasture and meadow, while the remaining 40 percent can be used for continuous-row crops or row crops in rotation with pasture or meadow. Institutional labor is available only in small quantity. Most labor for the farm operation must be hired.

Kentucky State Penitentiary - This Lyon County farm is separated into two tracts about 10 miles apart and each approximately that distance from the Penitentiary. The larger tract, known as the Beck Farm and by far the more productive, consists of 1,250 acres. The smaller one, known as the Yates Farm, has 387 acres and is mainly suited for pasture. These farms, in the Pembroke-Crider-Russellville Soil Association Area, are well-drained, moderately fertile soils that generally respond well to fertilization. More than 600 acres in the Beck Farm can be used for row crops, usually in short rotations.

Prison labor is available to do most of the work on this farm, though the inconvenience of transporting prisoners to the farm each day is a definite handicap.

## PRESENT USE OF STATE-OPERATED FOOD-PRODUCING RESOURCES

The 10 institutional farms in Kentucky are presently controlled by 4 separate agencies of state government through the particular institution with which the farm is associated. The farm manager of each farm is directly responsible to the superintendent or warden of that institution who, in turn, is responsible to either the Department of Welfare, the Department of Mental Health, the Department of Child Welfare, or the Department of Education.

The Division of Farm Management is organized in the Department of Welfare and acts in an advisory capacity to all farms. In addition, this division keeps records of all the farms in the system and does some accounting for farm expenditures. Generally, however, the farms are operated as organic parts of the institutions and not as part of an institutional farm system.

As a result of this type of organization, each farm operation is designed primarily to meet the food needs of that particular institution and not necessarily those of the system as a whole. Consequently, exchange of products, feeds, machinery, and other productive factors is difficult and at best a cumbersome procedure. There are, however, some instances of institutions having made agreements with other institutions to sell or exchange products. These are the exception rather than the rule.

Within this general organizational structure the resources of the state are directed mainly toward producing these categories of foods: (1) fruit and vegetables, (2) poultry products, (3) milk, (4) beef, and (5) pork.

### Fruit and Vegetables

Fruit or vegetables are produced at all the institutions except Eastern State Hospital which has only a small tract of land. For the system as a whole almost all fresh vegetables are produced on 560 acres of land and brought to the institutional kitchen. This amounted to 6,288,307 pounds with a commercial value of $388,000 during the last year. One hundred twenty-six acres located at 3 farms are in orchards and supply fresh fruit to other institutions in addition to their own requirements.

Vegetables and fruit in excess of immediate needs are canned at two canneries, located at the Reformatory and the Penitentiary. During 1959-60, 160,607 such gallons were canned for 6 institutions.

Vegetable production requires much patient and inmate labor. Besides its apparent therapeutic value, it is an enterprise well suited to this type of labor. Hence, it is not surprising to find nearly all institutions are engaged in growing vegetables and most of them doing an excellent job.

## Poultry Products

Institutional farms presently produce 40 percent of the 312,000 dozen eggs they require each year. Five of the institutions have laying flocks, ranging in size from 1,000 to 2,000 hens. These hens produce an average of 14.9 dozen eggs per hen and are fed an all-mash ration purchased from the prison feed mill.

Two of the five flocks are light breeds, while the remaining three have the heavier breeds, mainly so they can utilize cull hens for meat.

Broilers are grown at only three farms in the system. Last year these flocks furnished 9,000 birds - less than 15 percent of the amount needed. This is not surprising in light of the recent depressed broiler prices.

## Milk Production

The dairies have been the pride of the institutional farms in Kentucky. Milk production per cow from some 600 cows has averaged more than twice that for the state of Kentucky. Good herd management along with a good breeding program is evident in this enterprise and attests to the fact that institutional farms can produce a superior product.

Table 3 shows the average size of each of the seven dairies and current production per cow in each. Herd sizes range from a 53-cow herd at Kentucky State Penitentiary to a 145-cow herd at the Kentucky State Hospital. Milk production per cow ranges from a high of 14,083 pounds to 11,357, based on an average of 611 cows in production in the system.

TABLE 3

PRESENT SIZE AND PRODUCTION PER COW
OF INSTITUTIONAL DAIRIES

| Institution | Cows | Pounds of Milk Per Cow | Butterfat lb. |
|---|---|---|---|
| Central State Hospital | 68 | 14,083 | 516 |
| Kentucky State Penitentiary | 53 | 13,199 | 501 |
| Western State Hospital | 83 | 12,916 | 464 |
| Kentucky State Hospital | 145 | 12,226 | 448 |
| Kentucky State Reformatory | 136 | 12,075 | 446 |
| Kentucky Training Home | 70 | 11,379 | 421 |
| Kentucky Village | 55 | 11,357 | 418 |
| Total | 611 | -- | -- |
| Average | | 12,382 | 456 |

Dairy cows at all the institutional farms are fed a mixed ration purchased from the Prison Industries' feed mill located at the Kentucky State Reformatory. Milking cows are fed 4,338 pounds of a 16 percent ration, or an average rate of 1 pound of feed per 2.9 pounds of milk. Calves, heifers and dry cows are also fed a concentrate mixture purchased from Prison Industries. Most roughages in the dairy ration are grown on the farms where they are consumed; however, some hay is purchased.

Three of the seven dairies use a walk-through type milking parlor, while the remaining four dairies milk the cows in stanchions. All of the dairies use the bulk tank for storage, cooling and, in some instances, pasteurization.

## Beef Production

Beef production on institutional farms has not had the emphasis given other livestock enterprises. Of the 1,000,000 pounds of beef required annually at all institutions, only about 25 percent is produced on the farms. There are two beef herds in the institutional farm system, located at the Reformatory and the Penitentiary and consisting of 195 cows and 130 cows respectively. Two other institutions, the Children's Home and the School for the Deaf, buy feeder calves and finish them out for their own beef needs.

The brood cows and feeder calves are wintered mostly on hay and utilize pasture in the summer. Feeder cattle are fed in a dry lot, with grain purchased from the feed mill, and are slaughtered at approximately 1,000 pounds per head.

## Pork Production

About 70 percent of the total pork requirement is currently produced on the institutional farms. Some hogs are kept at all institutions except at Central State Hospital which is handicapped in the swine enterprise by its proximity to an urban area.

The 300 sows in the system are producing an average of 6.3 pigs per litter. Pigs are generally farrowed in farrowing houses and moved to pasture until weaning age. After this phase, the feeding operation varies from institution to institution depending on the facilities available. One institution, the Penitentiary, has in operation a modern hog feeding slab having a thousand-hog capacity where hogs are finished to slaughter weight. On other farms with limited facilities the feeding is done in lots or vacant barns.

Garbage is used intensively in the hog feeding program. About 3,000 tons are available each year from the institutions' kitchens. Typically, garbage is supplemented with a complete feed during the growing period and the hogs are then finished to slaughter weight on grain alone.

In addition, three farms, the Training Home, the Children's Home and the School for the Deaf, purchase feeder pigs and feed them to slaughter weight.

## MINIMUM FOOD COST FARM PROGRAM

The food production program outlined in this section is mainly the result of a linear programming solution to the problem of producing the required food at least cost; however, certain alterations were made in the final solution. Most changes involved "chopping off" uneconomically small units of an enterprise and combining these into units of a more efficient size.

The analysis indicated that all foods listed in Table 1 could be produced on the institutional farms cheaper than they could be purchased on the market, except for broilers which are currently (December 1961) selling at depressed prices. Further, with the purchase of approximately 250 acres of land and about 9 million pounds of feed grains annually, all this food can be produced on the institutional farms. It must be emphasized that the proposed program is based on the potential productivity of the land and not on its present capability. In some instances this will require that the fertility be raised to its potential.

Consequently, it is not recommended that this program be implemented all at once. Rather, a few years will be required for such an intensified program to be developed. Changes as suggested here require time to adjust the resource use to the new situation.

The difference in location and size of the major enterprises in the program can generally be explained by differences in soil capability, labor availability, building and equipment adaptability, and food requirements.

Location, size and rationale of the major food-producing enterprises indicated in the farm study are as follows:

Vegetable products - Vegetable production probably offers a greater advantage than any other enterprise on the institutional farms. It requires a large amount of labor, most of which under present conditions is suitable for inmates and patients. In addition, it provides the institutions with the freshest of vegetables, a commodity which is costly on the market.

Fresh vegetables can best be produced at the using institution, according to the analysis. This is mainly because each institution has the labor available - labor which in many instances has no other alternative use. In addition, institutional kitchens require this perishable product in relatively small amounts daily, an important factor in locating production at the point of consumption since hauling of foods in small quantities is costly.

Vegetables for canning and storage on the other hand can be most advantageously produced at or near the two canneries which are located at Kentucky State Reformatory and Kentucky State Penitentiary. These institutions have a large prisoner labor force which can be used in producing and processing vegetables for other institutions. Canned goods, unlike fresh vegetables, can be easily moved from the canneries to the using institutions in large quantities and at relatively low cost.

The acreage and approximate man hours of labor required at each institution for vegetable production are shown in Table 4. The acreage at each institution is based on an estimated yield per acre for each kind of vegetable in the institution's dietary requirement chart, allowing for double cropping where feasible. The labor requirements are based on standard man hours, not necessarily patient or inmate labor.

TABLE 4

VEGETABLE ACREAGE, POTENTIAL YIELD AND LABOR REQUIREMENTS AT EACH INSTITUTION

| Institution | Acres | | Yield | | Man Hours of Labor |
|---|---|---|---|---|---|
| | Fresh | Canned | Fresh (lb.) | Canned (gal.) | |
| Ky. Village | 32 | - | 404,832 | - | 7,437 |
| Ky. Training Home | 40 | - | 467,110 | - | 10,172 |
| Ky. State Hospital | 34 | - | 388,909 | - | 7,323 |
| Central State Hospital | 39 | - | 418,454 | - | 11,612 |
| Ky. School for Deaf | 9 | - | 96,455 | - | 1,713 |
| Ky. State Reformatory | 76 | 390 | 2,275,744[a] | 225,544 | 58,253 |
| Ky. Children's Home | 20 | - | 230,935 | - | 3,910 |
| Ky. State Penitentiary | 48 | 90 | 1,017,667[a] | 58,848 | 20,587 |
| Western State Hospital | 20 | - | 230,960 | - | 3,954 |
| Eastern State Hospital | 28 | - | 326,198 | - | 6,912 |
| Total | 346 | 480 | 5,860,264 | 284,394 | 131,873 |

[a]Includes potatoes for other institutions.

Poultry products - State institutions require 180,000 pounds of broilers and nearly one-quarter of a million dozen eggs per year for patients and inmates. A large portion of these products are presently being purchased on the market.

Egg costs, it appears, could be reduced by producing from institutional flocks the eggs which are now purchased, especially where laying houses are currently available. The location and size of these flocks would depend, to a large extent, on the poultry management ability of the supervisory personnel on the farms. Hence, a great deal of discretion should be left to management at the state level to decide on the location and relative sizes of laying flocks in the farm system.

TABLE 5

SUGGESTED SIZE, LOCATION AND ESTIMATED PRODUCTION OF LAYING FLOCKS IN THE INSTITUTIONAL FARM SYSTEM

| Institution | Hens | Eggs (dozen) |
|---|---|---|
| Western State Hospital | 1,356 | 25,764 |
| Ky. Training Home | 950 | 19,000 |
| Ky. Children's Home | 1,500 | 28,500 |
| Central State Hospital | 2,700 | 51,300 |
| Ky. State Reformatory | 10,400 | 197,500 |
| Total | 16,906 | 322,064 |

A suggested egg production program (Table 5) would have three institutions, the Training Home, the Children's Home and the Central State Hospital, which have housing facilities producing eggs only for their own consumption, and two institutions, Western State Hospital and Kentucky State Reformatory, producing for their own consumption as well as for the remaining institutions. This would require approximately 16,906 hens in five flocks.

With broiler prices at an all-time low, this product can be bought commercially for approximately the same expenditure that would be necessary to produce them on institutional farms. Consequently, it is not recommended that this product be produced as long as broiler prices remain near their present depressed level. In the event that prices level off at a substantially higher level, the enterprise should be given consideration.

Dairy products - There are almost enough dairy cows in the institutional farm system to furnish the institutions' milk requirements. Consequently, no appreciable over-all increase in the total number of cows is required; however, sweeping changes in the size and location of dairy herds would reduce the cost of producing the required milk.

Milk production is a heavy labor and capital user and requires a high level of management to maintain production at its present level. When the labor must be hired, as is the case in some institutional dairies, this results in substantially higher milk production costs. Hence, considerable savings can be made by consolidating some of the herds into larger, more efficient units located where adequate institutional labor is available. Specifically, it is proposed that the herds at Kentucky State Hospital and Central State Hospital be moved to the Reformatory Farm, increasing the size of this herd to about 426 cows. This large dairy would furnish milk to Central State Hospital, Eastern State Hospital, Kentucky State Hospital, School for the Deaf, Children's Home, and Kentucky State Reformatory. The dairy herd at Western State Hospital would be added to the herd at the Kentucky State Penitentiary and the consolidated herd would supply milk for both institutions. The herds at the Kentucky Village and the Training Home would remain at about their present size and location because of therapeutic and training considerations.

Because some time will be necessary to bring the land in the Reformatory farm to a level of productivity high enough to support a larger herd as well as other enterprises suggested for the farm, the consolidation and expansion of this herd should take place over a period of three to four years. Owing to the inadequacy of the dairy buildings at Central State Hospital, the herd there should be moved to the Reformatory as soon as its dairy center is completed and the feed supply becomes adequate. The Reformatory herd would then consist of about 200 cows. As feed supplies continue to increase, the herd could be increased by keeping heifers from this herd and the Kentucky State Hospital herd. The last major step in the transition would be the movement of the Kentucky State Hospital herd to the Refomatory.

TABLE 6

PROPOSED SIZE AND LOCATION AND ESTIMATED ANNUAL MILK PRODUCTION OF DAIRIES IN THE INSTITUTIONAL FARM SYSTEM

| Herd | Size | Production (gal.) |
|---|---|---|
| Ky. State Reformatory | 426 | 643,953 |
| Ky. State Penitentiary | 126 | 183,140 |
| Ky. Training Home | 70 | 88,721 |
| Ky. Village | 64 | 81,860 |
| Total | 686 | 997,674 |

These changes would require a substantial investment in modern dairy facilities at two institutions (see Table 35) and result in a less intensive use of facilities at the mental hospital. Nevertheless, the savings resulting from decreased payrolls and lower equipment investment per cow at the large dairies would more than offset these disadvantages in the years ahead. The dairy barns and feed storage area at these mental institution farms could, in most cases, be utilized for beef cattle, which require considerably less labor.

All heifer calves from the dairy herds would be kept until breeding age. Most of them would be needed for replacements in the dairy herds, and the remaining heifers could be made available to Kentucky farmers as replacements at a reasonable price. This revenue would help defray purchase of some 3,000,000 pounds of dairy feed.

Beef cattle - The state institutions require about 1,000,000 pounds of beef annually. This is equivalent to nearly 1,700 live animals weighing 1,000 pounds each. Currently, they are producing a little over one fourth of this amount. Expansion of this enterprise is presently handicapped by inadequate slaughter facilities, discussed elsewhere in this report.

Beef cattle production is accomplished in two distinct operations: the production of a feeder calf (about 450 pounds) and the feeding of this calf to about 1,000 pounds. In most cases, each operation may be handled best at different institutions. Feeder calf production requires little grain and lots of roughage and is best adapted to rolling terrain which should be in pasture. The beef feeding, on the other hand, can be accomplished in a feedlot but requires considerable amounts of grain.

Accordingly, it is proposed that the feeding operation be consolidated and located at Kentucky State Reformatory to supply beef for the institutions in the Central Kentucky area and at Kentucky State Penitentiary for the two institutions in the western part of the state. Feeder calves, a low-labor user, would be produced mostly at the mental institutions in place of the dairy herds that would be moved elsewhere. When these calves are weaned at about 450 pounds they would be moved to either the Reformatory or the Penitentiary, placed in a feedlot, and fed to approximately 1,000 pounds before slaughtering.

The size and location of the proposed beef cow herds and beef feeding operations are shown in Table 7. The beef cow enterprise is a feeder calf producing enterprise, with each cow producing 0.75 of a feeder calf (assuming an average 90 percent calf crop and that 15 percent of the cows are replaced each year), and the beef feeder enterprise is a drylot operation.

The 1,279 beef feeders include 312 Holstein steer feeder calves as a by-product of the dairy herds. Beef requirements, in addition to the 1,279 feeder cattle, are obtained from cull cows in the beef and dairy herds.

TABLE 7

SIZE OF BEEF COW AND BEEF FEEDER HERDS
PROPOSED AT EACH INSTITUTION

| Institution | Beef Cows | Beef Feeders |
|---|---|---|
| Ky. Village | 44 | - |
| Ky. State Hospital | 600 | - |
| Central State Hospital | 172 | - |
| Ky. State Reformatory | 192 | 1,008 |
| Ky. State Penitentiary | 62 | 289 |
| Western State Hospital | 246 | - |
| Total | 1,316 | 1,279 |

The location of the feedlot operation at Kentucky State Reformatory is complementary with the feed mixing mill already located there along with a possible slaughter plant. The smaller feeding operation would be located at the Kentucky State Penitentiary, a surplus-grain-producing institution, as well as at the location of a possible second

Pork - Like the beef enterprise, pork production is accomplished in two separate processes: producing feeder pigs and feeding these pigs to slaughter weight. Production of the 5,000 feeder pigs needed in the system can be economically centralized at three institutions where most facilities are available, the Reformatory, the Penitentiary, and the Kentucky Village. Even then, some additional farrowing facilities would need to be added.

An important factor in the location of the hog-feeding operation is the availability of over 3,000 tons of garbage annually at the various institutions. This, when cooked, can be supplemented with grain to form a low-cost pork feeding program. Hence, a large part of this feeding enterprise is best decentralized, at least to the extent that the garbage is utilized. In most cases, this would require the construction of sanitary confinement feeding facilities, the generally accepted hog feeding method.

Table 8 shows the size and location of the feeder pig (given in number of sows) and hog feeding enterprises, along with the amount of garbage available. All feeding operations are assumed to be on concrete feeding slabs. Feeder pig production will utilize farrowing houses and a small amount of land for exercise. When pigs reach about 40 pounds they are weaned and moved to a concrete feeding slab where they are fed a mixed ration supplemented with garbage, if available. When hogs reach 200 pounds they will

be sent to one of the two slaughter plants to be slaughtered and processed for distribution to the using institution.

TABLE 8

PROPOSED SIZE AND LOCATION OF SWINE ENTERPRISES AND QUANTITIES OF GARBAGE AVAILABLE EACH YEAR IN THE INSTITUTIONAL FARM SYSTEM

| Institution | Sows | Feeders | Garbage (ton) |
|---|---|---|---|
| Ky. Training Home | - | 442 | 840 |
| Ky. State Hospital | - | 158 | 301 |
| Ky. School for Deaf | - | 31 | 58 |
| Ky. State Reformatory | 273 | 3,060 | 785 |
| Ky. Village | 12 | 162 | 657 |
| Ky. State Penitentiary | 104 | 1,400 | 785 |
| Total | 389 | 5,253 | 3,426 |

The proposed 273-sow herd at the Reformatory will require a high level of competence and diligence on the part of management if it is to function successfully. In herds of this size, strict attention to sanitation and disease control is imperative. If management personnel that will give attention to these requisites are not provided, swine death losses are likely to be so high that efficiencies due to low labor and low overhead costs will be more than offset and feeder pig costs will be increased rather than decreased.

Slaughtering - The program outlined above would result in the production of about 5,000 meat animals at institutions in the Central Kentucky area and about 3,000 at those in Western Kentucky.

At present all of the beef and most of the hogs produced are slaughtered in local slaughter plants on a custom basis.[2] Meat returned from custom slaughtering is received by the institutional kitchens where it is cut and prepared for cooking.

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[2]The hog slaughtering facilities at the Penitentiary and the Reformatory are not adequate from the point of view of sanitation.

Installation of adequate meat slaughtering and processing facilities at the Penitentiary and Reformatory would have certain advantages. Among these is that it would make possible a training program in butchering for the inmates at these institutions. The desirability of such a program is, however, outside the scope of this study, thus, no evaluation of it is made in this report.

Installation of complete slaughtering and processing facilities would be quite expensive and might not reduce the costs of providing meat ready for cooking. The probable initial cost would be about $200,000 at the Reformatory and about $150,000 at the Penitentiary.

Annual costs, including depreciation, at the Reformatory would probably be about $30,000 or $6.00 per animal processed. Total annual costs at the Penitentiary would be lower by about $5,000 but on a per-animal basis would be about $8.33 or about 30 percent higher than at the Reformatory. The end product, however, would be ready for cooking whereas the custom slaughterers return the meat to the institution in wholesale cuts. The additional processing would consist of slicing, curing, mixing, aging, rendering, and boning where necessary. Mixed and processed meats such as hamburger, sausage and bologna would be produced at the institutions whereas most of these are now purchased.

In addition to the benefits derived from the additional processing, the offal from slaughtering could presumably be sold and this would reduce the cost of the edible products substantially. The custom slaughterers now keep the offal in addition to the custom rate which they charge.

An alternative method is to continue the practice of custom slaughtering but to install processing facilities at the Penitentiary and the Reformatory. Meat returned from custom slaughtering, chilled and in wholesale cuts, could then be readied for the kitchens and some of the inmates trained as meat cutters in the process. This alternative would be less costly but would narrow somewhat the scope of the training program by eliminating the slaughtering phase. The probable capital outlay required at the Reformatory for a processing installation only would be about $90,000 and at Eddyville about $70,000. On an annual basis, again including depreciation, the costs would probably be about $12,000 at the Reformatory and about $9,000 at the Penitentiary. The annual cost figures are based on the assumption that any personnel needed in the processing plant would be offset by reductions in kitchen personnel requirements. Thus, no labor costs are included.

The relative desirability of these alternatives depends on the prices which can be obtained for offal and the importance attached to an inmate training program in this area.

## Individual Farm Programs

Individual farm programs, as has been previously pointed out, are designed to meet the over-all objective of the system. Consequently, an individual farm operation may seem to bear no relation to that institution's food requirements. However, when viewed in relation to the other farms and institutions, its contribution should be clear.

Kentucky Village - The proposed program for this farm is a fairly diversified one. It would have a livestock program consisting of a 64-cow dairy herd - enough for the Village's milk requirement - a 44-cow beef herd, and 12 sows with pigs to be fed out to slaughter weight (Table 9A).

To support this livestock program, a cropping program (Table 9B) would furnish all the silage and pasture requirement and most of the hay. A small amount of hay (19 tons) would be obtained from the Kentucky School for the Deaf. The small grain produced would be taken to the Prison Industry feed mill and exchanged for an equivalent amount of the mixed feed or corn for the beef enterprise. The remainder of the feed grain would be purchased from the feed mill.

Kentucky Training Home - The livestock program of this farm would remain much as it is at the present time - a dairy to supply their own needs and hogs to utilize their garbage (Table 10A). Hay, silage and pasture for the dairy herd would be produced on the farm while a small amount of small grain would be exchanged for some of the 286 tons of mixed feed that is needed. The study indicated that 436 tons of silage should be used to supplement the pasture for the dairy herd.

TABLE 9A

PROPOSED LIVESTOCK PROGRAM FOR
KENTUCKY VILLAGE FARM

| Livestock | Quantity | Amounts of Resources Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM[a]) | Labor (hours) |
| Dairy Cows | 64 | 141 | 128 | 256 | 448 | 6,272 |
| Dairy Heifers | 29 | 21 | 73 | 58 | 203 | 667 |
| Beef Cows | 44 | 5 | 40 | 79 | 308 | 440 |
| Hogs | 162 | 40 | - | - | - | 243 |
| Sows | 12 | 20 | - | - | - | 180 |
| Total | | 227 | 241 | 393 | 959 | 7,802 |

[a] Animal Unit Grazing Month.

TABLE 9B

PROPOSED CROPPING PROGRAM FOR
KENTUCKY VILLAGE FARM

| Crop or Rotation | Acres | Yield | | | | Labor (hours) |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | |
| Vegetables | 32 | - | - | - | - | 7,437 |
| CS-GL-L[a] | 69 | 1,442 | 89 | 393 | - | 780 |
| Alfalfa | 39 | - | 133 | - | - | 663 |
| Pasture | 255 | - | - | - | 959 | 1,022 |
| Total | 395 | 1,442 | 222 | 393 | 959 | 9,902 |

[a] CS-GL-L - three year-rotation consisting of corn silage followed by small grain and two years of lespedeza.

TABLE 10A

PROPOSED LIVESTOCK PROGRAM FOR
KENTUCKY TRAINING HOME FARM

| Livestock | Quantity | Amounts of Resource Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Dairy Cows | 70 | 154 | 154 | 280 | 560 | 9,310 |
| Dairy Heifers | 31 | 22 | 78 | 62 | 217 | 713 |
| Hogs | 442 | 110 | - | - | - | 663 |
| Hens | 950 | 59 | - | - | - | 1,425 |
| Total | | 345 | 232 | 342 | 770 | 12,111 |

TABLE 10B

PROPOSED CROPPING PROGRAM FOR
KENTUCKY TRAINING HOME FARM

| Crop or Rotation | Acres | Yield | | | | Labor (hours) |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | |
| Vegetables | 40 | - | - | - | - | 10,172 |
| Corn Silage | 29 | - | - | 464 | - | 435 |
| CS-GL-L[a] | 31 | 542 | 34 | 146 | - | 350 |
| CS-AAAA[b] | 60 | - | 132 | 168 | - | 996 |
| Alfalfa | 25 | - | 76 | - | - | 425 |
| Pasture | 158 | - | - | - | 480 | 633 |
| Total | 343 | 542 | 242 | 778[c] | 480 | 13,011 |

[a]CS-GL-L - one year corn silage followed by small grain and two years of lespedeza.

[b]CS-AAAA - five years rotation consisting of one year corn silage and four years of alfalfa.

[c]436 tons silage used to replace pasture (equiv. to 297 AUGM).

Kentucky State Hospital - This large farm, which is presently a dairy farm, would be a beef cattle farm producing feeder calves under the proposed program (Table 11A). These feeder calves, an estimated 450 per year, would be moved to the Kentucky State Reformatory farm after weaning to be fed to slaughter weight. All silage and pasture and less than one-half of the hay for the beef herd would be produced on the farm. The remainder of the hay would be produced on the farm at the Kentucky School for the Deaf. Small grain would be transported to the feed mill at Kentucky State Reformatory.

Central State Hospital - Beef cattle would be the only livestock enterprise on this farm. Hog production was not considered as an enterprise. The farm would furnish silage and pasture for the beef cow herd while hay, in addition to that produced, would be furnished from the farm at the Children's Home (Tables 12A and 12B).

TABLE 11A

PROPOSED LIVESTOCK PROGRAM FOR
KENTUCKY STATE HOSPITAL FARM

| Livestock | Quantity | Amounts of Resources Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Beef Cows | 600 | 72 | 540 | 1,080 | 4,200 | 6,000 |
| Hogs | 158 | 40 | - | - | - | 237 |
| Total | | 112 | 540 | 1,080 | 4,200 | 6,237 |

TABLE 11B

PROPOSED CROPPING PROGRAM FOR
KENTUCKY STATE HOSPITAL FARM

| Crop or Rotation | Acres | Yield | | | | |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Vegetables | 34 | - | - | - | - | 7,323 |
| CS-GL-L[a] | 161 | 4,106 | 209 | 1,079 | - | 1,819 |
| Pasture | 1,111 | - | - | - | 4,160 | 4,452 |
| Total | 1,306 | 4,106 | 209 | 1,079 | 4,160 | 13,594 |

[a]CS-GL-L - three years rotation consisting of one year of corn silage followed by small grain and two years of lespedeza.

TABLE 12A

PROPOSED LIVESTOCK PROGRAM FOR
CENTRAL STATE HOSPITAL FARM

| Livestock | Quantity | Amounts of Resources Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Beef Cows | 172 | 21 | 155 | 310 | 1,204 | 1,720 |
| Hens | 2,700 | 167 | - | - | - | 4,050 |
| Total | | 188 | 155 | 310 | 1,204 | 5,770 |

TABLE 12B

PROPOSED CROPPING PROGRAM FOR
CENTRAL STATE HOSPITAL FARM

| Crop or Rotation | Acres | Yield | | | | Labor (hours) |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | |
| Vegetables | 39 | - | - | - | - | 11,612 |
| Corn | 31 | 2,883 | - | - | - | 279 |
| CS-GL-L[a] | 58 | 1,102 | 70 | 307 | - | 655 |
| Pasture | 291 | - | - | - | 1,206 | 1,166 |
| Total | 419 | 3,985 | 70 | 307 | 1,206 | 13,713 |

[a]CS-GL-L - three years rotation consisting of one year of corn silage followed by small grain and two years of lespedeza.

Kentucky School for the Deaf - Besides hogs to utilize the garbage and space for growing fresh vegetables for the School, the acreage on this small farm would be used for hay and grain to feed livestock on other farms in the system. Corn and hay to balance the beef cow herd requirements would be hauled to the Kentucky State Hospital and the Kentucky Village. The remaining hay and grain would go to the Kentucky State Reformatory (Tables 13A and 13B).

Kentucky State Reformatory - In addition to being the largest farm in the system in terms of acres, the Reformatory farm would also have the most intensive farm operation. A 426-cow dairy herd would be located here to supply milk to the Reformatory and to five other institutions; all beef cattle to be slaughtered in the Central Kentucky area as well as most of the hogs will be finished in a feedlot operation at the Reformatory. A large farrowing operation (273 sows) would also be carried out on this farm (Table 14A).

In addition to growing crops to support this mammoth livestock program, 466 acres would be devoted to the production of the fresh vegetable requirements and canned vegetables for the other institutions in Central Kentucky (Table 14B). The land resources on this farm would supply all pasture and silage needs and most of the hay. A large quantity of grain would have to be purchased from the prison industry feed mill located there.[3]

Kentucky Children's Home - The small farm (85 acres of cropland) associated with this institution would be put in alfalfa except for fresh vegetable acreage, according to the farm study (Tables 15A and 15B). The estimated 310 tons of alfalfa hay from this farm would be used at the Central State Hospital and the Kentucky State Reformatory farms.

Kentucky State Penitentiary - Although there are two tracts of land associated with this institution, the plan calls for them to be operated as one farm unit. The enterprises to be allocated between the two farms and the delegation of responsibility would be left to the discretion of management.

This farm unit would function for the two institutions in Western Kentucky in much the same way as the Kentucky State Reformatory farm would for the institutions in Central Kentucky, although not on such a large scale. It would feed out and slaughter the beef and hogs, produce the milk, and grow canning vegetables for Western State Hospital as well as the Penitentiary. In addition to providing crops to feed the livestock, it would furnish hay (90 tons) and grain for institutional farms in Central Kentucky (Tables 16A and 16B).

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[3]Either corn or alfalfa silage substituted for grain in the beef feeding operation would be likely to reduce the cost of producing beef. Under present conditions very little land capable of producing silage is available for this purpose. Should such land become available in the future, substitution of some silage for grain in the beef ration would permit some reduction in beef production costs. However, it is doubtful that these savings by themselves would justify the purchase of additional land.

TABLE 13A

PROPOSED LIVESTOCK PROGRAM FOR
KENTUCKY SCHOOL FOR THE DEAF FARM

| Livestock | Quantity | Amounts of Resources Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Hogs | 31 | 8 | - | - | - | 46 |

TABLE 13B

PROPOSED CROPPING PROGRAM FOR
KENTUCKY SCHOOL FOR THE DEAF FARM

| Crop or Rotation | Acres | Yield | | | | Labor (hours) |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | |
| Vegetables | 9 | - | - | - | - | 1,713 |
| C-C-RC-RC[a] | 92 | 4,140 | 92 | - | - | 782 |
| Alfalfa | 91 | - | 309 | - | - | 1,547 |
| Total | 192 | 4,140 | 401 | | | 4,042 |

[a]C-C-RC-RC - four years rotation consisting of two years of corn and two years of red clover.

TABLE 14A

PROPOSED LIVESTOCK PROGRAM FOR
KENTUCKY STATE REFORMATORY FARM

| Livestock | Quantity | Amounts of Resources Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Dairy Cows | 426 | 937 | 937 | 1,704 | 3,408 | 41,748 |
| Dairy Heifers | 191 | 135 | 477 | 382 | 1,337 | 4,393 |
| Beef Cows | 192 | 23 | 173 | 346 | 1,344 | 1,920 |
| Beef Feeders Fed | 1,008 | 1,270 | 403 | - | - | 9,072 |
| Hog Feeders | 3,060 | 765 | - | - | - | 4,590 |
| Sows | 273 | 450 | - | - | - | 4,095 |
| Hens | 10,400 | 645 | - | - | - | 15,600 |
| Total | | 4,225 | 1,990 | 2,432 | 6,089 | 81,418 |

TABLE 14B

PROPOSED CROPPING PROGRAM FOR
KENTUCKY STATE REFORMATORY FARM

| Crop or Rotation | Acres | Yield | | | | Labor (hours) |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | |
| Vegetables | 466 | - | - | - | - | 40,421 |
| Corn Silage | 49 | - | - | 931 | - | 735 |
| CS-GL-L[a] | 264 | 5,518 | 317 | 1,505 | - | 2,983 |
| Alfalfa | 466 | - | 1,398 | - | - | 7,922 |
| Pasture | 1,619 | - | - | - | 6,089 | 6,490 |
| Total | 2,864 | 5,518 | 1,715 | 2,436 | 6,089 | 58,551 |

[a] CS-GL-L - three-year rotation consisting of one year of corn silage followed by small grain and two years of lespedeza

TABLE 15A

PROPOSED LIVESTOCK PROGRAM FOR
KENTUCKY CHILDREN'S HOME FARM

| Livestock | Quantity | Amounts of Resources Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Hens | 1,500 | 93 | - | - | - | 2,250 |

TABLE 15B

PROPOSED CROPPING PROGRAM FOR
KENTUCKY CHILDREN'S HOME FARM

| Crop or Rotation | Acres | Yield | | | | Labor (hours) |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | |
| Vegetables | 20 | - | - | - | - | 3,910 |
| Alfalfa | 66 | - | 198 | - | - | 1,122 |
| Total | 86 | | 198 | | | 5,032 |

TABLE 16A

PROPOSED LIVESTOCK PROGRAM FOR
KENTUCKY STATE PENITENTIARY FARM

| Livestock | Quantity | Amounts of Resources Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Dairy Cows | 126 | 277 | 277 | 504 | 1,008 | 12,348 |
| Dairy Heifers | 57 | 40 | 142 | 114 | 399 | 1,311 |
| Beef Cows | 62 | 7 | - | 112 | 434 | 620 |
| Beef Feeders | 289 | 286 | 173 | - | 1,156 | 2,601 |
| Hogs | 1,400 | 350 | - | - | - | 2,100 |
| Sows | 104 | 172 | - | - | - | 1,560 |
| Total | | 1,132 | 648 | 730 | 2,997 | 20,540 |

TABLE 16B

PROPOSED CROPPING PROGRAM FOR
KENTUCKY STATE PENITENTIARY FARM

| Crop or Rotation | Acres | Yield | | | | Labor (hours) |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | |
| Vegetables | 138 | - | - | - | - | 17,249 |
| Corn | 108 | 10,584 | - | - | - | 972 |
| C-GRC-RC[a] | 420 | 22,302 | 588 | - | - | 4,620 |
| CS-GL-L[b] | 116 | 2,645 | 151 | 731 | - | 1,311 |
| Pasture | 855 | - | - | - | 3,304 | 3,427 |
| Total | 1,637 | 35,531 | 739 | 731 | 3,304 | 27,579 |

[a]C-GRC-RC - one year of corn followed by small grain and two years of red clover

[b]CS-GL-L - one year of corn silage followed by small grain and two years of red clover

It may be interesting to note that this was the only farm on which the study indicated it was less costly to full feed the feeder cattle on pasture rather than in drylot, as was recommended for the farm at the Kentucky State Reformatory. This can be explained by the fact that the Penitentiary farm has more land relative to the food needs of that area than is true in Central Kentucky.

Western State Hospital - Like the mental institution farms in Central Kentucky, this farm would be a beef cattle farm producing feeder calves to be fed out at the Kentucky State Penitentiary farm (Tables 17A and 17B). Besides providing hay, silage and corn for the beef cows, some hay and grain would be shipped to Central Kentucky.

## Product and Resource Transfer

To take advantage of the economies of specialization within the institutional farm system, a considerable quantity of products and resources will have to be transported among institutions to balance their food and resource requirements. The resources used to transport this material are costs due to specialization and reduce, to some extent, savings from specialization.

Feeder calves - With feeder calf production generally decentralized and the feeding operation centralized at two institutions, a total of 858 feeder calves would need to be hauled 51,814 animal-miles per year (Table 18). The hauling could be accomplished in state-owned trucks and, if possible, scheduled so that other livestock or material could be hauled on the return trip.

Swine - Feeder pig production is to be centralized mainly at two institutions, finished at several institutions and then slaughtered at two centralized locations. This procedure necessitates moving the feeder pigs to the feeding operation and then back to the slaughter plant. Most of the feeder pigs, however, would be farrowed, fed and slaughtered at the same institution. Six hundred thirty-one feeder pigs would be moved 34,406 animal-miles to the feed slabs, and 793 finished hogs would be moved 45,746 animal-miles back to the location of the dressing plant (Tables 19 and 20).

Feed Grains - All mixed rations in the system would come from the feed mill located at the Reformatory. All livestock enterprises would use this type of feed except beef cattle which could utilize unprocessed corn if available locally. Excess grain produced at any farm would be shipped to the feed mill where it would be used in the milling operation.

Mixed feed would be transported to eight institutions from the Reformatory for a total of 231,060 ton-miles (Table 21). Farm-produced grains, totaling 49,087 corn-equivalent bushels, would be transported 8,465,467 bushel-miles (Table 21). Most of the farm-produced grains could be moved to the Reformatory on trucks returning from mixed feed delivery.

Hay - A total of 586 tons of hay would have to be moved 27,935 ton-miles in the institutional farm system in order to balance out feed requirements (Table 23). Fluctuations in crop production would necessitate movement of more or less than this amount when surpluses or shortages occur.

TABLE 17A

PROPOSED LIVESTOCK PROGRAM FOR
WESTERN STATE HOSPITAL FARM

| Livestock | Quantity | Amounts of Resources Required | | | | |
|---|---|---|---|---|---|---|
| | | Grain (ton) | Hay (ton) | Silage (ton) | Pasture (AUGM) | Labor (hours) |
| Beef Cows | 246 | 30 | 221 | 443 | 1,722 | 2,460 |
| Hens | 1,356 | 84 | - | - | - | 2,034 |
| Total | | 114 | 221 | 443 | 1,722 | 4,494 |

TABLE 17B

PROPOSED CROPPING PROGRAM FOR
WESTERN STATE HOSPITAL FARM

| Crop or Rotation | Acres | Yield | | | | Labor (hours) |
|---|---|---|---|---|---|---|
| | | Corn Equiv. (bu.) | Hay (ton) | Silage (ton) | Pasture (AUGM) | |
| Vegetables | 20 | - | - | - | - | 3,954 |
| Corn | 44 | 4,224 | - | - | - | 396 |
| Corn Silage | 23 | - | - | 437 | - | 345 |
| C-GRC-RC[a] | 169 | 8,974 | 237 | - | - | 2,146 |
| Pasture | 479 | - | - | - | 1,720 | 1,920 |
| Total | 735 | 13,198 | 237 | 437 | 1,720 | 8,761 |

[a]C-GRC-RC - one year of corn followed by small grain and two years of red clover

TABLE 18

TRANSPORTATION OF FEEDER CALVES IN THE INSTITUTIONAL FARM SYSTEM

| Transported From | Transported To: Ky. St. Reform. | Transported To: Ky. St. Pen. | Miles | Animal-Miles |
|---|---|---|---|---|
| Ky. Training Home | 32 | - | 42 | 1,344 |
| Ky. State Hospital | 450 | - | 83 | 37,350 |
| Central State Hospital | 129 | - | 15 | 1,935 |
| Ky. Village | 62 | - | 70 | 4,340 |
| Western St. Hospital | - | 185 | 37 | 6,845 |
| Total | 673 | 185 | | 51,814 |

TABLE 19

TRANSPORTATION OF FEEDER PIGS IN THE INSTITUTIONAL FARM SYSTEM

| Transported To | Transported From: Ky. St. Reform. | Miles | Animal-Miles |
|---|---|---|---|
| Ky. Training Home | 442 | 42 | 18,564 |
| Ky. State Hospital | 158 | 83 | 13,114 |
| Ky. School for Deaf | 31 | 88 | 2,728 |
| Total | 631 | | 34,406 |

TABLE 20

TRANSPORTATION OF FINISHED HOGS IN
THE INSTITUTIONAL FARM SYSTEM

| Transported From | Transported To Ky. St. Reform. | Miles | Animal-Miles |
|---|---|---|---|
| Ky. Training Home | 442 | 42 | 18,564 |
| Ky. State Hospital | 158 | 83 | 13,114 |
| Ky. School for Deaf | 31 | 88 | 2,728 |
| Ky. Village | 162 | 70 | 11,340 |
| Total | 793 | | 45,746 |

TABLE 21

TRANSPORTATION OF FEED FROM THE FEED MILL
AT KENTUCKY STATE REFORMATORY

| Institution | Quantity (tons) | Miles | Ton-Miles |
|---|---|---|---|
| Ky. Village | 227 | 70 | 15,890 |
| Ky. Training Home | 345 | 42 | 14,490 |
| Ky. State Hospital | 40 | 83 | 3,320 |
| Ky. School for Deaf | 8 | 88 | 704 |
| Ky. State Penitentiary | 839 | 210 | 176,190 |
| Western State Hospital | 84 | 195 | 16,380 |
| Ky. Children's Home | 93 | 17 | 1,581 |
| Central State Hospital | 167 | 15 | 2,505 |
| Total | 1,803 | | 231,060 |

TABLE 22

FARM-PRODUCED GRAIN TRANSPORTED TO
THE KENTUCKY STATE REFORMATORY

| Institution | Corn Equivalent (Bu.) | Miles | Bushel-Miles |
|---|---|---|---|
| Ky. Village | 1,442 | 70 | 100,940 |
| Ky. Training Home | 542 | 42 | 32,764 |
| Ky. State Hospital | 4,106 | 83 | 340,798 |
| Ky. School for Deaf | 1,740 | 88 | 153,120 |
| Central State Hospital | 3,297 | 15 | 49,455 |
| Ky. State Penitentiary | 25,746 | 210 | 5,406,660 |
| Western State Hospital | 12,214 | 195 | 2,381,730 |
| Total | 49,087 | | 8,465,467 |

TABLE 23

TRANSPORTATION OF HAY AMONG FARMS IN THE
INSTITUTIONAL FARM SYSTEM

| Transported From | Transported To: Ky. Vill. (Tons) | Ky. St. Hosp. (Tons) | Cent. St. Hosp. (Tons) | Ky. St. Reform. (Tons.) | Total (Tons) | Ton-Miles |
|---|---|---|---|---|---|---|
| Ky. School for Deaf | 20 | 331 | - | 50 | 401 | 6,915 |
| Ky. Children's Home | - | - | 85 | - | 85 | 170 |
| Ky. St. Penitent. | - | - | - | 90 | 90 | 18,900 |
| West. St. Hosp. | - | - | - | 10 | 10 | 1,950 |
| Total | 20 | 331 | 85 | 150 | 586 | 27,935 |

Meats - beef and pork - All beef and pork in the system would be processed at two institutions and delivered to the other institutions as needed. Hauling could either be done on a contractual arrangement or by a state-owned refrigerated truck.

The volume of meats to be transported in the Central Kentucky area is more than a million pounds, or an average daily rate of nearly one and one-half tons. In Western Kentucky the average daily volume is less than one-half ton, involving shipment to only one institution. In the Central Kentucky area meat would be moved 26,890 ton-miles on an annual basis while the Western Kentucky area would involve 5,957 ton-miles (Table 24).

TABLE 24

TRANSPORTATION OF MEATS[a] AMONG INSTITUTIONS

| Transported To | Transported From: Ky. St. Reform. (tons) | Transported From: Ky. St. Pen. (tons) | Miles | Ton-Miles |
|---|---|---|---|---|
| Ky. Village | 76 | - | 70 | 5,320 |
| Ky. Children's Home | 31 | - | 17 | 527 |
| Ky. Training Home | 73 | - | 42 | 3,066 |
| Central State Hospital | 131 | - | 15 | 1,965 |
| Ky. State Hospital | 109 | - | 83 | 9,047 |
| Eastern State Hospital | 79 | - | 67 | 5,293 |
| Ky. School for Deaf | 19 | - | 88 | 1,672 |
| Western State Hospital | - | 161 | 37 | 5,957 |
| Total | 518 | 161 | | 32,847 |

[a]Includes beef and pork.

Milk - Milk distribution in the institutional farm system would be made from two dairies: the Kentucky State Reformatory and the Kentucky State Penitentiary. The former would furnish 403,050 gallons of milk per year to five other institutions in Central Kentucky, and the latter 100,000 gallons per year to one institution, Western State Hospital. Milk distribution from the Reformatory and the Penitentiary farms would total 18,882,250 gallon-miles and 3,700,000 gallon-miles respectively (Table 25).

TABLE 25

TRANSPORTATION OF MILK AMONG INSTITUTIONS

| Transported To | Transported From Ky. St. Reform. (gal.) | Ky. St. Pen. (gal.) | Miles | Gallon-Miles |
|---|---|---|---|---|
| Ky. State Hospital | 81,400 | - | 83 | 6,756,200 |
| Central State Hospital | 118,800 | - | 15 | 1,782,000 |
| Ky. School for Deaf | 23,600 | - | 88 | 2,076,800 |
| Ky. Children's Home | 74,850 | - | 17 | 1,272,450 |
| Eastern State Hospital | 104,400 | - | 67 | 6,994,800 |
| Western State Hospital | - | 100,000 | 37 | 3,700,000 |
| Total | 403,050 | 100,000 | | 22,582,250 |

Milk would be transported in dispenser-type cans and could be delivered every two or three days. In Central Kentucky two routes might be scheduled for the five institutions receiving milk with each route being served on alternate days.

Canned fruit and vegetables - Fruit and vegetables would be canned at two locations, the Reformatory and the Penitentiary, and moved to the other institutions in the system. Since these items are easily stored at either the cannery or the using institution, they could be transported at any convenient time in trucks which would otherwise be empty or partially full.

An estimated 202,004 gallons of canned goods would need to be transported 13,000,351 gallon-miles from the Reformatory. The cannery at the Penitentiary would ship 29,529 gallons to Western State Hospital (Table 26).

Eggs - It is suggested that two institutions produce eggs to be consumed at other institutions. In Western Kentucky, Western State Hospital would produce eggs for the Penitentiary. These could be picked up by the truck delivering milk from the Penitentiary dairy. The Reformatory would produce eggs for those institutions in Central Kentucky which do not produce their own. Delivery could be made along with milk and meat products (Table 27).

TABLE 26

TRANSPORTATION OF CANNED FRUITS AND VEGETABLES FROM CANNERIES TO CONSUMING INSTITUTIONS

| Transported To | Transported From: Ky. St. Reform. (gal.) | Transported From: Ky. St. Pen. (gal.) | Miles | Gallon-Miles |
|---|---|---|---|---|
| Ky. Village | 7,407 | - | 70 | 518,490 |
| Ky. Children's Home | 11,148 | - | 17 | 189,516 |
| Ky. Training Home | 19,309 | - | 42 | 810,978 |
| Central State Hospital | 18,910 | - | 15 | 283,650 |
| Ky. State Hospital | 85,849 | - | 83 | 7,125,467 |
| Eastern State Hospital | 54,918 | - | 67 | 3,679,506 |
| Ky. School for Deaf | 4,463 | - | 88 | 392,744 |
| Western State Hospital | - | 29,529 | 37 | 1,092,573 |
| Total | 202,004 | 29,529 | | 14,092,924 |

TABLE 27

TRANSPORTATION OF EGGS FROM PRODUCING TO CONSUMING INSTITUTIONS

| Transported To | Transported From: Ky. St. Reform. (dozen) | Transported From: West. St. Hosp. (dozen) | Miles | Mile-Dozens |
|---|---|---|---|---|
| Ky. State Penitentiary | - | 8,300 | 37 | 307,100 |
| Ky. Village | 22,715 | - | 70 | 1,590,050 |
| Eastern State Hospital | 43,085 | - | 67 | 2,886,695 |
| Ky. State Hospital | 77,200 | - | 83 | 6,407,600 |
| Ky. School for Deaf | 5,082 | - | 88 | 447,216 |
| Total | 148,082 | 8,300 | | 11,638,661 |

## Role of Centralized Management

Success in attaining the low-cost food production program is dependent upon a single decision-making unit with authority and responsibility. The role of the single decision-making unit is to supervise each farm unit as a part of the institutional farm program. A coordinated transfer of products and resources among the individual farms through the farm managers must be provided.

## BENEFITS, COSTS AND CAPITAL REQUIREMENTS OF MINIMUM COST FOOD PROGRAM

The estimated annual costs of the proposed farm program, as well as the capital outlay required for its implementation, are summarized in this section.

### Annual Costs

Estimated annual costs of the proposed farm program are divided into the following five categories: (1) crop production, (2) vegetable production and processing, (3) livestock, (4) personal services, and (5) transportation. In estimating these items of cost, it was assumed that the necessary capital outlay has been made; hence, these are annual costs only and do not include the necessary capital outlay which is summarized separately below.

Crop production - The major items of nonlabor expense in producing crops are: (1) fertilizer, (2) seed and insecticides, and (3) machinery costs. Fertilizer costs are based on applications which are considered sufficient to maintain crop production at the level assumed in this study. Total fertilizer costs for all farms are estimated at $58,000 annually. Seed costs for field crops would amount to $14,000, while machinery costs would total $78,000 annually. This is the estimated total annual expenditure necessary to operate the machinery and to maintain it at the required level. The total annual costs (excluding labor) of the field crop program would be about $150,000 per year (Table 28).

TABLE 28

ESTIMATED ANNUAL COSTS OF FIELD CROP PRODUCTION ON INSTITUTIONAL FARMS

| Institution | Fertilizer | Seed | Machinery | Total |
|---|---|---|---|---|
| Ky. Village | $ 1,400 | $ 700 | $ 3,600 | $ 5,700 |
| Ky. Children's Home | 900 | 200 | 2,000 | 3,100 |
| Ky. Training Home | 1,800 | 600 | 4,400 | 6,800 |
| Central State Hospital | 3,600 | 700 | 3,000 | 7,300 |
| Ky. State Hospital | 4,300 | 2,200 | 7,600 | 14,100 |
| Ky. School for Deaf | 1,700 | 500 | 4,700 | 6,900 |
| Western State Hospital | 7,000 | 1,500 | 7,400 | 15,900 |
| Ky. State Reformatory | 23,600 | 4,500 | 26,900 | 55,000 |
| Ky. State Penitentiary | 14,100 | 3,600 | 18,200 | 35,900 |
| Total | $58,400 | $14,500 | $77,800 | $150,700 |

Vegetable costs - Costs of producing fresh and canned vegetables for all institutions (Table 29) consist of fertilizer, seed and insecticides, machinery and canning costs. These items are in addition to the initial cost of the physical producing and processing facilities.

Vegetable production requires a relatively large outlay per acre for all these items of expense and, in addition, the costs involved in canning are comparatively large. Machinery costs, next to canning costs in magnitude, amount to $26,000. The total annual cost of vegetable production and canning is $116,000 (Table 29).

TABLE 29

ESTIMATED ANNUAL VARIABLE COST OF VEGETABLE PRODUCTION AND PROCESSING IN THE INSTITUTIONAL FARM SYSTEM

| Institution | Fertilizer | Seed & Insecticides | Machinery | Canning | Total |
|---|---|---|---|---|---|
| Ky. Village | $ 470 | $ 700 | $ 1,340 | $ - | $ 2,510 |
| Ky. Children's Home | 310 | 470 | 840 | - | 1,620 |
| Ky. Training Home | 630 | 930 | 1,680 | - | 3,240 |
| Central State Hospital | 570 | 860 | 1,640 | - | 3,070 |
| Eastern State Hospital | 420 | 620 | 1,180 | - | 2,220 |
| Ky. State Hospital | 520 | 780 | 1,430 | - | 2,730 |
| Ky. School for Deaf | 100 | 160 | 380 | - | 640 |
| Western State Hospital | 310 | 470 | 840 | - | 1,620 |
| Ky. State Reformatory | 7,660 | 9,990 | 12,580 | 48,450 | 78,680 |
| Ky. State Penitentiary | 2,260 | 3,030 | 4,280 | 10,050 | 19,620 |
| Total | $13,250 | $18,010 | $26,190 | $58,500 | $115,950 |

Livestock products - The largest single item of cost in livestock production is feed. All of the roughages would be produced on the farms; however, less than one-third of the more than 6,000 tons of concentrates needed for the livestock program would be produced on the institutional farms. The remaining feed grains would be purchased from the prison industry feed mill at the Reformatory. Much of the farm-produced grain would be taken to the feed mill and exchanged for an equivalent amount of mixed feed.

Feed purchases (Table 30) for each institution are the amounts required in addition to the farm-produced grains, hence, the purchases for some farms are negative indicating that more grain is produced in these farms than used. Net purchases of concentrates for the entire system total 5,119 tons and require an expenditure of $254,000.

Other livestock expenses are for items such as drugs, power, bedding, and miscellaneous equipment required for livestock production. These items total $89,000 for all farms, making the total annual livestock costs $343,000.

TABLE 30

ESTIMATED ANNUAL COSTS OF LIVESTOCK ENTERPRISES
FOR THE PROPOSED INSTITUTIONAL FARM PROGRAM

| Institution | Feed Purchases | | Other Expense | Total |
|---|---|---|---|---|
| | Tons | Cost | | |
| Ky. Village | 198 | $ 11,279 | $ 4,428 | $ 15,707 |
| Ky. Children's Home | 93 | 5,499 | 1,354 | 6,853 |
| Ky. Training Home | 334 | 19,307 | 5,695 | 25,002 |
| Central State Hospital | 103 | 6,106 | 5,130 | 11,236 |
| Ky. State Hospital | (38) | (2,308) | 9,416 | 7,108 |
| Ky. School for Deaf | (26) | (1,527) | 31 | (1,496) |
| Western State Hospital | (153) | (9,075) | 4,675 | (4,400) |
| Ky. State Reformatory | 4,242 | 202,467 | 47,813 | 250,280 |
| Ky. State Penitentiary | 366 | 22,158 | 10,712 | 32,870 |
| Total | 5,119 | $253,906 | $89,254 | $343,160 |

Note: Figures in parentheses represent negative figures.

Transportation costs - The costs of transporting food products and resources among the institutions are difficult to estimate. They depend largely on load sizes and the extent to which transportation can be scheduled so as to minimize travel with empty or partially filled trucks. The cost estimates (Table 31) are based on the assumption that a full load is carried one way on each trip and that trucks return empty. Actually, not all trucks would be fully loaded nor would all return empty, thus, these factors tend to be offsetting.

TABLE 31

ESTIMATED ANNUAL COST OF TRANSPORTING PRODUCTS AMONG STATE INSTITUTIONS

| Product | Quantity | Units | Unit-Miles | Cost |
|---|---|---|---|---|
| Livestock | 2,282 | animals | 134,248 | $ 1,458 |
| Hay | 586 | ton | 27,935 | 1,117 |
| Grain, Mixed | 1,803 | ton | 231,060 | 9,242 |
| Grain, Farm-Produced | 1,473 | ton | 253,989 | 10,161 |
| Meat | 679 | ton | 32,847 | 4,800 |
| Milk | 5,030 | 100 gal. | 225,822 | 8,000 |
| Canned Goods | 2,335 | 100 gal. | 142,329 | 2,277 |
| Total | | | | $37,054 |

Livestock to be transported total 2,282 head and include feeder calves, feeder pigs, and hogs. They would be transported 134,248 animal-miles at a cost of $1,458. Hay, a bulky product, would be moved 27,935 ton-miles at a cost of $1,117 per year. Grains, both farm-produced and processed and totaling 3,276 tons annually, account for nearly $20,000 of the total transportation costs. Meats totaling 679 tons account for $4,800 of the transportation costs.[4] Transportation of more than one-half million gallons of milk annually will

[4]This is based on the assumption that all meats are processed at the Reformatory for Central Kentucky and at the Penitentiary for Western Kentucky. Any variation of this slaughtering arrangement will alter the cost of transportation.

cost approximately $8,000. Canned goods transported from the two canneries to the using institution will cost an estimated $2,277. Total transportation costs are estimated at $37,054 per year.

Other items to be transported among institutions including eggs, machinery, and bedding are not included in the cost estimates because they are either relatively insignificant in amount or they can usually be moved on a truck that otherwise would be empty.

Personal services - As presently operated, the farm operations require the employment of about 100 people and costs of personal services amount to about $365,000 in addition to the costs of the Division of Farm Management. In the proposed program the number of employees would be reduced to 47 or about one half the present number. However, in order to attract and hold personnel with the high level of competence and managerial ability required, it would be necessary to be able to pay higher salaries. Consequently, the costs of personal services would not be reduced in proportion to the reduction in number of personnel. These costs would amount to about $241,000.[5]

TABLE 32

DISTRIBUTION OF EMPLOYEES BY PAY GRADE
IN INSTITUTIONAL FARM SYSTEM

| Grade | Number |
|---|---|
| 12 | 6 |
| 17 | 7 |
| 21 | 18 |
| 23 | 13 |
| 25 | 2 |
| 27 | 3 |
| Total | 47 |

Table 32 shows the number of employees in each pay grade under the proposed program. The reduction in employee numbers would take place mainly in the lower grades since these would be replaced by prisoner labor.

[5]This estimate is based on the assumption that each employee receives the middle salary for his pay grade. At any given time some would be higher and some lower.

TABLE 33

NUMBER OF EMPLOYEES AND PERSONAL SERVICE COST BY INSTITUTIONS

| Institutions | Employees (number) | Personal Service Cost[a] (dollars) |
|---|---|---|
| Ky. School for Deaf | 1 | $ 5,232 |
| Ky. Children's Home | 1 | 5,232 |
| Eastern State Hospital | 1 | 5,232 |
| Ky. State Reformatory | 14 | 75,156 |
| Ky. State Hospital | 6 | 29,916 |
| Ky. Training Home | 3 | 16,224 |
| Ky. Village | 4 | 21,456 |
| Central State Hospital | 5 | 19,572 |
| Western State Hospital | 5 | 23,520 |
| Ky. State Penitentiary | 7 | 39,444 |
| Total | 47 | $240,984 |

[a]In addition to the Division of Farm Management.

By far the largest number of employees would be located at the Reformatory for a number of reasons. The farm operation there would be very large both in terms of number of enterprises and their size. Increases in either the size or the number of enterprises result in increased risks of loss due either to poor management or to good management having too much to do. Consequently, all employees at the Reformatory would have only supervisory duties, and prisoners from the institution would be expected to do all the manual labor. Each enterprise supervisor would have at least one assistant in order that supervisory personnel might be on the farm or be on call at all times. The farm manager would have a full-time assistant. In addition, an agronomist would be headquartered at the Reformatory, though his services would be available to other institutionsl farms when needed, at least to those in the Central Kentucky area.

The same considerations would apply at the Penitentiary though to a lesser extent since the size of the entire operation and of the individual enterprises is considerably smaller than at the Reformatory.

At the remaining institutions, fewer problems could be expected and fewer employees have been provided in the proposed plan of operation. At the mental hospitals, labor costs could be reduced to some extent if it were possible to provide labor from the prisons to help with peak labor loads, e.g., harvesting of silage and hay.

Summary of annual costs - Total annual cost of the proposed farm program after it becomes operative is estimated to be $1,046,864 (Table 34). In addition to items of costs discussed previously (Table 34), $100,000, or about 10 percent of the total, is for miscellaneous farm expenses which do not logically fall in any of these categories.

TABLE 34

SUMMARY OF ESTIMATED ANNUAL COSTS
OF PROPOSED FARM PROGRAM

| Item | Cost |
|---|---|
| Field Crops | $ 150,700 |
| Vegetables | 115,950 |
| Livestock | 343,160 |
| Transportation | 37,054 |
| Personal Services | 300,000 |
| Miscellaneous | 100,000 |
| Total | $1,046,864 |

Capital outlay - Implementation of the program proposed above would require some initial outlay for buildings and feed handling facilities as well as additional breeding livestock and additional land (Table 35). Most of this initial outlay would be made at the Reformatory where it would amount to more than a half-million dollars and at the Penitentiary where it would amount to almost a quarter-million dollars.

TABLE 35

CAPITAL OUTLAY REQUIRED FOR IMPLEMENTATION
OF PROPOSED FARM PROGRAM

| | | |
|---|---|---|
| Capital Construction and Equipment | | |
| Kentucky State Reformatory | | |
| Slaughter house and cold storage | $200,000 | |
| Dairy center and processing | 300,000 | |
| Hog feeding slabs | 20,000 | |
| Laying houses | 35,000 | |
| Beef feedlot and equipment | 17,500 | |
| Farrowing house | 12,000 | |
| Silo | 4,000 | |
| Cannery (additional building) | 15,000 | |
| Additional irrigation equipment and water supply | 10,000 | |
| | | $ 613,500 |
| Kentucky Village | | |
| Dairy center | 60,000 | |
| Hog feeding slabs | 15,000 | |
| | | 75,000 |
| Kentucky Training Home | | |
| Vegetable storage and utility building | 20,000 | |
| Hog feeding slabs | 7,500 | |
| | | 27,500 |
| Central State Hospital | | |
| Silo | | 4,000 |

TABLE 35 continued

| | | |
|---|---|---|
| Kentucky State Hospital | | |
| Silo (two) | | $ 8,000 |
| Eastern State Hospital | | |
| Vegetable storage and utility building | | 20,000 |
| Kentucky State Penitentiary | | |
| Slaughter house and cold storage | $150,000 | |
| Vegetable storage and utility building | 25,000 | |
| Hog feeding slabs | 5,000 | |
| Laying houses | 3,000 | |
| Additional dairy housing and equipment | 35,000 | |
| Silos (four) | 16,000 | |
| | | 234,000 |
| Western State Hospital | | |
| Silo | | 4,000 |
| Total capital construction and equipment | | 986,000 |
| Other Capital Outlay | | |
| Beef cows (1,000) | 175,000 | |
| Beef bulls (35) | 20,000 | |
| Land (250 acres) | 62,500 | |
| Total Other Capital Outlay | | 257,500 |
| TOTAL CAPITAL OUTLAY | | $1,243,500 |

Examination of Table 35 will indicate that the initial cost of the slaughter facilities and associated cold storage at both penal institutions would amount to about $350,000. This is more than one fourth of the total capital outlay deemed necessary. It was pointed out earlier that the desirability of these depends partly on nonmonetary considerations.

The largest of the remaining items are the dairy center at the Reformatory and about 1,000 beef cows needed for the production of feeder calves. The outlay for the dairy center includes funds necessary for the pasteurization, homogenization, canning and cooling of the milk produced. This necessitates about 1,500 five-gallon cans, a can washer and can racks as well as a can washing and storage room and cooler for canned milk. The milk would be distributed to the receiving institutions in cans as requested by the institutions and transported in refrigerated trucks.

There is, however, an alternative method of accomplishing the same tasks at about the same annual cost and with a considerably smaller initial outlay. By this method a holding tank would be placed at each institution and filled from a bulk tank truck from the Reformatory. The milk would then be canned from this tank as needed. This would result in elimination of the cans, can washer, and racks with the necessary housing for them as well as the cooler for canned milk. It would be necessary to install a holding tank at each receiving institution and to substitute a tank truck for the refrigerated can-hauling truck. This procedure would probably reduce the inititial outlay required by about $50,000 and should also simplify the sanitation problem by eliminating the need for practically all can washing. It is possible that some suitable holding tanks are already available in the system. If so, this would permit further reductions in the necessary initial outlay.

The total capital outlay amounts to $1,243,500. Of this amount, $541,000 or about 44 percent is deemed necessary by the Division of Farm Management for continued operation of the present system and has been requested by the Division. However, the cost estimates included in this report for the items already requested by the Division of Farm Management are somewhat higher than estimates previously submitted. In addition, fertilizer costs can be expected to be above the estimates in Tables 28 and 29 during the first few years of the program.

The extent to which prisoner labor can be utilized in providing the necessary buildings and equipment is not known. However, should this be possible, it would reduce substantially the cost of the required items.

## Costs versus Savings of Proposed Program

The institutional farm program outlined in this report could be expected to produce all the foods listed in Table 1, page 1. If these foods were bought at present wholesale prices, it would cost the Commonwealth about $1,938,000 per year. On the other hand, it would require an initial investment of $1,243,500 in order to get this program under way and an estimated outlay of $1,046,864 to operate the program each year.

The $891,136 difference in the value of foods produced and the annual cost of the program represents only the monetary return on the institutional labor resources and on the investment in about 8,000 acres of land, buildings and equipment as well as the necessary $1.2 million initial outlay. The therapeutic and rehabilitative benefits remain the ultimate justification for state ownership and operation of the farm system.

# APPENDIX

## APPENDIX A

TOTAL QUANTITIES OF SELECTED FOOD CATEGORIES REQUIRED EACH YEAR FOR KENTUCKY STATE INSTITUTIONS*

| | KV | KCH | KTH | KSR | KSP | CSH | KSH | WSH | ESH | KSD | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Beef, cwt | 624 | 276 | 846 | 1,782 | 540 | 2,376 | 846 | 1,632 | 996 | 168 | 10,086 |
| Pork, cwt | 899 | 343 | 613 | 1,506 | 505 | 251 | 1,338 | 1,579 | 589 | 208 | 7,826 |
| Broilers and Hens, lb | 12,870 | 9,977 | 34,320 | 10,494 | 5,775 | 22,440 | 10,010 | 52,800 | 22,000 | 543 | 181,229 |
| Milk (cwt) | 7,202 | 6,437 | 7,515 | 15,734 | 2,770 | 10,217 | 7,002 | 8,632 | 8,978 | 2,031 | 76,518 |
| Egg (Doz) | 22,715 | 28,512 | 17,820 | 49,421 | 8,316 | 39,981 | 77,200 | 19,448 | 43,005 | 5,082 | 311,580 |
| Fresh fruit and vegetables (lb) | 474,760 | 332,935 | 725,760 | 1,360,922 | 909,477 | 649,398 | 648,951 | 348,470 | 542,714 | 148,011 | 6,141,398 |
| Canned fruit and vegetables (gal) | 9,407 | 11,148 | 19,309 | 120,907 | 37,167 | 18,910 | 29,529 | 54,918 | 4,463 | 4,463 | 391,607 |

*Abbreviations of institutions:

KV - Kentucky Village
KCH - Kentucky Children's Home
KTH - Kentucky Training Home
KSR - Kentucky State Reformatory
KSP - Kentucky State Penitentiary
CSH - Central State Hospital
KSH - Kentucky State Hospital
WSH - Western State Hospital
ESH - Eastern State Hospital
KSD - Kentucky School for the Deaf

APPENDIX B

PROPOSED LIVESTOCK AND CROP PROGRAMS AT THE STATE INSTITUTIONAL FARMS

| Enterprise | KTH | KSH | CSH | KSD | KSR | KV | WSH | KSP | KCH | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Livestock | | | | | | | | | | |
| Dairy cows | 70 | - | - | - | 426 | 64 | - | 126 | - | 686 |
| Dairy heifers | 31 | - | - | - | 191 | 29 | - | 57 | - | 308 |
| Beef cows | - | 600 | 172 | - | 192 | 44 | 246 | 62 | - | 1,316 |
| Feeder calves | 32 | 450 | 129 | - | 313 | 84 | 185 | 104 | - | (1,297) |
| Beef Slaughter animals | - | - | - | - | 1,008 | - | - | 289 | - | 1,297 |
| Hog feeder | 442 | 158 | - | 31 | 3,060 | 162 | - | 1,400 | - | 5,253 |
| Sows | - | - | - | - | 273 | 12 | - | 104 | - | 389 |
| Hens | 950 | - | 2,700 | - | 10,400 | - | 1,356 | - | 1,500 | 16,906 |
| Crops, acres | | | | | | | | | | |
| Corn | - | - | 31 | 46 | - | - | 100 | 247 | - | 424 |
| Corn silage | 51 | 53 | 19 | - | 136 | 23 | 23 | 38 | - | 343 |
| Alfalfa | 73 | - | - | 91 | 466 | 39 | - | - | 66 | 735 |
| Lespedeza | 21 | 108 | 39 | - | 177 | 46 | - | 78 | - | 469 |
| Pasture | 158 | 1,111 | 291 | - | 1,619 | 255 | 479 | 855 | - | 4,768 |
| Vegetables | 40 | 34 | 39 | 9 | 466 | 32 | 20 | 138 | 20 | 798 |
| TOTAL ACRES | 343 | 1,306 | 419 | 192 | 2,864 | 395 | 735 | 1,637 | 86 | 7,977 |

## APPENDIX C

### TOTAL ACRES OF CROPS AND ROTATIONS IN THE PROPOSED KENTUCKY STATE INSTITUTIONAL FARM SYSTEM

| Crop or Rotation | Acres | YIELD | | | | |
|---|---|---|---|---|---|---|
| | | Silage (ton) | Hay (ton) | Grain (ton) | Pasture (augm)* | Bedding (ton) |
| 1. Vegetables | 826 | - | - | - | - | - |
| 2. Corn, cont. | 183 | - | - | 17,691 | - | - |
| 3. Corn silage, cont. | 101 | 1,832 | - | - | - | - |
| 4. C-C-RC-RC[a] | 92 | - | 92 | 4,141 | - | - |
| 5. C-GRC-RC[b] | 589 | - | 825 | 31,276 | - | 324 |
| 6. CS-GL-L[c] | 699 | 4,161 | 870 | 15,355 | - | 397 |
| 7. CS-A-A-A-A[d] | 60 | 168 | 132 | - | - | - |
| 8. Alfalfa | 687 | - | 2,116 | - | - | - |
| 9. Pasture | 4,768 | - | - | 17,918 | - | - |
| TOTAL | 8,005 | 6,161 | 4,035 | 68,462 | 17,918 | 721 |

*Animal Unit Grazing Month

[a]Two years of corn followed by two years of red clover.

[b]Three-year rotation consisting of one year of corn followed by small grain and two years of red clover.

[c]Three-year rotation consisting of one year of corn silage followed by small grain and two years of lespedeza.

[d]Five-year rotation consisting of one year of corn silage and four years of alfalfa.

## APPENDIX D

### TABLE 1 -- ACRES OF LAND AT KENTUCKY STATE REFORMATORY[a] CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre: Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm.) | Corn Silage (ton) |
|---|---|---|---|---|---|---|---|---|---|
| R | 547 | b | 94.0 | 62.2 | 3.6 | 2.2 | 2.0 | 6.1 | 18.8 |
| RM | 158 | c | 84.9 | 55.4 | 3.1 | 2.0 | 1.8 | 5.9 | 17.0 |
| RMM | 43 | 12 | 84.0 | 55.4 | 3.1 | 2.0 | 1.9 | 5.9 | 16.8 |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 0 | - | - | - | - | - | - | - | - |
| GMM | 0 | - | - | - | - | - | - | - | - |
| M | 1,168 | d | - | - | 3.0 | - | 1.7 | 5.5 | - |
| Pasture | 949 | e | - | - | - | - | - | - | - |
| TOTAL | 2,865 | | | | | | | | |

[a]Includes 230 acres at Women's Prison Farm

[b]Field Nos. 1, 4a, 9, 21a, c, 26a, 28, 31a, c, 36, 37, 45a, 47a, 48a, b, 49, 52a, d, c, 55, 57, 72, 73, 79, 88, 89, 91, 97, 98, 102, 103, 104, 110

[c]Field Nos. 11, 29, 30, 45b, 52b, 64, 83, 87, 95, 96, 101

[d]Field Nos. 10, 16, 17, 18, 27, 31b, 39, 40, 42, 43, 44, 46, 53a, 56, 58, 60, 61, 66, 67, 68, 69, 70, 71, 74, 75, 76, 77, 82, 85, 90, 100, 106a, 107b

[e]Field Nos. 2, 3, 4b, 7, 8, 19, 20, 22, 24b, 25, 26b, 32, 34, 35, 38, 51, 53b, 54, 62, 63, 78

TABLE 2 -- ACRES OF LAND AT KENTUCKY STATE PENITENTIARY (YATES FARM)
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 71 | 2, 7, 10 | 84.0 | 57.1 | 3.1 | 2.0 | - | 5.4 | 16.8 |
| RM | 74 | 15, 19, 20 | 78.0 | 48.7 | 2.7 | 1.8 | - | 5.3 | 15.6 |
| RMM | 0 | - | - | - | - | - | - | - | - |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 0 | - | - | - | - | - | - | - | - |
| GMM | 0 | - | - | - | - | - | - | - | - |
| M | 20 | 15, 19, 20a, b | - | - | 2.7 | - | - | 5.3 | - |
| Pasture | 222 | 1, 2, 4, 6, 7, 9, 10, 12, 13, 14, 16, 18 | - | - | - | - | - | 5.2 | - |
| TOTAL | 387 | | | | | | | | |

TABLE 3 -- ACRES OF LAND AT KENTUCKY STATE PENITENTIARY (BECK FARM)
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 175 | $1a_1$, lb, 2b 6, 9, 17, 27 | 104 | 68.9 | 3.9 | 2.4 | 2.1 | 6.3 | 20.8 |
| RM | 9 | 5 | 93 | 62.2 | 3.6 | 2.2 | 2.0 | 6.0 | 18.6 |
| RMM | 453 | $1a_2$, lc, ld, 2a, c, 4, 7, 10, 20, 23, 25a | 93 | 62.2 | 3.7 | 2.2 | 2.0 | 6.0 | 18.6 |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 0 | - | - | - | - | - | - | - | - |
| GMM | 0 | - | - | - | - | - | - | - | - |
| M | 216 | 3, 8, 11, 12 14, 15, 16, 18, 21, 22 | - | - | 3.3 | - | 1.9 | 5.8 | - |
| Pasture | 397 | 24, 25b, 28, 29, 31, 32, 34, 37, 38, 42 | - | - | - | - | - | - | - |
| TOTAL | 1,250 | | | | | | | | |

TABLE 4 -- ACRES OF LAND AT KENTUCKY VILLAGE
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 95 | 2c, d, 8b, c, d, e, 13a, 15c, 20, 22b | 93.0 | 62.2 | 3.7 | 2.2 | 2.1 | 6.0 | 18.6 |
| RM | 23 | 1a, 10, 16 | 92.6 | 60.5 | 3.5 | 2.2 | 2.0 | 5.9 | 18.5 |
| RMM | 23 | 2b, e, 23a, | 79.3 | 51.1 | 3.1 | 1.8 | - | 5.8 | 15.9 |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 0 | - | - | - | - | - | - | - | - |
| GM | 0 | - | - | - | - | - | - | - | - |
| M | 164 | 1a, b, 2a, 5, 7, 8a, 9 12, 14, 15a, 15b, d, 21 | - | - | 3.0 | - | - | 5.5 | - |
| Pasture | 90 | 3, 4, 6, 11, 13b, 17, 18 19, 24, 25 | - | - | - | - | - | 4.8 | - |
| TOTAL | 395 | | | | | | | | |

TABLE 5 -- ACRES OF LAND AT KENTUCKY TRAINING HOME
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 69 | 1b, 4, 10, 23c, d, e | 77.8 | 51.5 | 2.7 | 1.8 | 1.7 | 5.5 | 15.6 |
| RM | 17 | 1a | 68.0 | 43.4 | 2.6 | 1.7 | 1.6 | 5.0 | 13.6 |
| RMM | 21 | 3b, 13b | 70.9 | 47.2 | 3.1 | 1.8 | 1.7 | 5.0 | 14.2 |
| RMMM | 32 | 23a, 23g | 65.4 | 42.9 | 2.8 | 1.7 | 1.6 | 4.8 | 13.1 |
| RMMMM | 18 | 20, 23f | 76.0 | 50.1 | 3.0 | 1.8 | 1.8 | 5.1 | 15.2 |
| GMM | 10 | 23b | - | 30.1 | 2.0 | - | - | 4.1 | - |
| M | 73 | 3a, c, 9, 13a, 17 | - | - | 3.2 | - | 1.3 | 5.1 | - |
| Pasture | 103 | 2a, 5, 6, 22 | - | - | - | - | - | 3.8 | - |
| TOTAL | 343 | | | | | | | | |

TABLE 6 -- ACRES OF LAND AT WESTERN STATE HOSPITAL
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 87 | 8e, h, j, 10a, 12a | 96.0 | 63.8 | 3.5 | 2.2 | 2.0 | 6.1 | 19.2 |
| RM | 127 | 8b | 97.0 | 65.5 | 3.7 | 2.2 | 2.0 | - | 19.4 |
| RMM | 73 | 12b, 16a, 18, 19c | 80.9 | 52.2 | 2.9 | 2.0 | 1.9 | 5.7 | 16.2 |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 0 | - | - | - | - | - | - | - | - |
| GM | 0 | - | - | - | - | - | - | - | - |
| M | 122 | 8g, 9, 14b 16b, 19a | - | - | 2.9 | - | 1.8 | 5.3 | - |
| Pasture | 326 | 2a, c, 4, 5b, 6a | - | - | - | - | - | 4.9 | - |
| TOTAL | 735 | | | | | | | | |

TABLE 7 -- ACRES OF LAND AT CENTRAL STATE HOSPITAL
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 70 | 2, 6, 11, 14, 15 | 93.0 | 62.2 | 3.7 | 2.2 | 1.9 | 6.1 | 18.6 |
| RM | 124 | 1, 3, 13, 23 | 80.0 | 50.4 | 3.6 | 1.9 | 1.9 | 5.8 | 16.0 |
| RMM | 0 | - | - | - | - | - | - | - | - |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 0 | - | - | - | - | - | - | - | - |
| GMM | 0 | - | - | - | - | - | - | - | - |
| M | 225 | 4, 5, 7, 8, 9, 11, 16, 17, 18, 20, 21, 22 | - | - | 3.5 | - | 1.9 | 5.8 | - |
| Pasture | 0 | - | - | - | - | - | - | - | - |
| TOTAL | 419 | | | | | | | | |

TABLE 8 -- ACRES OF LAND AT KENTUCKY CHILDREN'S HOME
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 66 | 2, 3, 4, 7, 8, 10, 11, 12, 14a, b | 98.0 | 65.5 | 3.9 | 2.4 | 2.0 | 6.2 | 19.6 |
| RM | 0 | - | - | - | - | - | - | - | - |
| RMM | 0 | - | - | - | - | - | - | - | - |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 0 | - | - | - | - | - | - | - | - |
| GMM | 0 | - | - | - | - | - | - | - | - |
| M | 19 | 5, 6 | - | - | 2.8 | - | - | 5.1 | - |
| Pasture | 0 | - | - | - | - | - | - | - | - |
| TOTAL | 85 | | | | | | | | |

TABLE 9 -- ACRES OF LAND AT KENTUCKY SCHOOL FOR THE DEAF
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 17 | 3, 4b, 8, 9a, 12a, b | 104.0 | 70.6 | 3.9 | 2.4 | 2.0 | 6.3 | 20.8 |
| RM | 84 | 1, 2, 4a, c, 5b, 9b, 20 | 90.0 | 57.1 | 3.5 | 2.0 | 1.9 | 5.8 | 18.0 |
| RMM | 0 | - | - | - | - | - | - | - | - |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 0 | - | - | - | - | - | - | - | - |
| GMM | 0 | - | - | - | - | - | - | - | - |
| M | 90 | 5a, 7, 10 | - | - | 3.4 | - | - | 5.8 | - |
| Pasture | 1 | - | - | - | - | - | - | - | - |
| TOTAL | 192 | | | | | | | | |

TABLE 10 -- ACRES OF LAND AT KENTUCKY STATE HOSPITAL
CLASSIFIED ACCORDING TO ITS MOST INTENSIVE SOIL CONSERVATION SERVICE ROTATION GROUPING

| Rotation Group | Acres | Field (Nos) | Potential Yield Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Corn (bu) | Barley (bu) | Alfalfa (ton) | Red Clover (ton) | Lespedeza (ton) | Pasture (augm) | Corn Silage (ton) |
| R | 59 | 12, 14a, 32a, 36, 40, 47 | 101.0 | 67.2 | 3.9 | 2.4 | - | 6.2 | 20.2 |
| RM | 99 | 6, 7b, 14c 15, 17a, 17b, 19 | 82.4 | 55.4 | 3.4 | 2.0 | - | 5.3 | 16.5 |
| RMM | 79 | 4, 9 | 65.2 | 45.0 | 2.9 | 1.7 | - | 4.8 | 13.0 |
| RMMM | 0 | - | - | - | - | - | - | - | - |
| RMMMM | 53 | 2, 5, 7c | 73.8 | 50.2 | 3.2 | 1.9 | - | 5.3 | 14.8 |
| GMM | 35 | 14b | 78.0 | 52.1 | 3.3 | 2.0 | - | - | 15.6 |
| M | 222 | a | - | - | 3.2 | - | - | 5.2 | - |
| Pasture | 759 | b | - | - | - | - | - | 3.8 | - |
| TOTAL | 1,306 | | | | | | | | |

[a] 20, 21, 22, 23, 24, 25, 26, 28, 30, 38, 44, 46, 48, 49, 51

[b] 1, 7a, 8, 10, 13, 16, 18, 29, 31, 32b, 35, 37, 39, 41, 50