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AUTHOR Miller, Daniel R.; And Others
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ABSTRACT

To improve vocational educational programs in agriculture, occupational information on a common core of basic skills within the occupational area of the feed mill workers is presented in the revised task inventory survey. The purpose of the occupational survey was to identify a common core of basic skills which are performed and are essential for success in the occupation. Objectives were accomplished by constructing an initial task inventory to identify duty areas and task statements for the occupation. The initial task inventory was reviewed by consultants in the field, and 135 tasks were identified. A random sample of 75 retail feed businesses based on the 1975 directory of the Ohio Grain, Feed, and Fertilizer Association, Inc. was obtained. Data were collected utilizing employer and employee questionnaires. Forty-two questionnaires were returned of which 39 were usable. A compilation of basic sample background information is presented on size of feed mill, total work experience, employment at current job, and preparation as a feed mill worker. A compilation of duty areas of work performed and work essential for the occupation is given. Percentage performance by incumbent workers and the average level of importance of specific task statements are presented in tabular form. (Author/EC)

DETERMINATION OF A COMMON CORE OF BASIC SKILLS IN AGRIBUSINESS AND NATURAL RESOURCES

An Emperical Determination Of Tasks Essential To Successful Performance As A Feed Mill Worker

DEPARTMENT OF AGRICULTURAL EDUCATION
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO 43210

AN EMPERICAL DETERMINATION OF TASKS ESSENTIAL TO SUCCESSFUL PERFORMANCE AS A FEED MILL WORKER

Daniel R. Miller

Edgar P. Yoder

J. David McCracken

Department of Agricultural Education
in cooperation with
The Ohio State University Research Foundation
The Ohio State University
Columbus, Ohio

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FOREWORD

The Department of Agricultural Education at The Ohio State University is involved in a major programmatic effort to improve the curricula in educational programs in agriculture. One product in this effort is this report of the feed mill worker task inventory survey. The data reported were collected as part of a more comprehensive thrust designed to develop a common core of basic skills in agribusiness and natural resources.

It is hoped that the revised task inventory contained in this report will be useful to curriculum developers working for improved occupational relevance in schools. Twenty-seven additional inventories in other occupational areas are also reported from this project.

The profession owes its thanks to Daniel R. Miller, graduate research associate, for his work in preparing this report. Special appreciation is also expressed to George G. Greenleaf, Executive Vice President, Ohio Grain, Feed, and Fertilizer Association, Inc., for his input and help in securing the cooperation of those employed in this occupational area.

J. David McCracken
Project Director

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INTRODUCTION

Occupational information is needed to develop and revise vocational and technical education curricula. Teachers and curriculum developers generally determine which skills might be taught in a program based upon teacher expertise, advisory committee input, informal and formal community surveys, and/or task inventories.

The Agricultural Education Department at The Ohio State University has utilized and revised a system for obtaining and using occupational information as an effective aid in planning, improving, and updating occupational education curricula. This report presents the results of a task analysis survey of the occupation, feed mill worker. The information contained herein may be used by curriculum development specialists, teachers, local and state administrators, and others involved in planning and conducting vocational and technical programs in agriculture.

Purpose and Objectives

The major purpose of the occupational survey was to identify the skills which are performed and essential for success as a feed mill worker. The specific objectives of this survey were as follows:

1. Develop and validate an initial task inventory for the feed mill worker.
2. Identify the specific tasks performed by the feed mill worker.
3. Determine the relative importance of the specific tasks to successful employment as a feed mill worker.

Definition of the Occupational Area

The feed mill worker works in retail feed mills or country elevators which deal directly with the public. The specific duties performed by the feed mill worker will vary with the size and type of business. The feed mill worker is primarily involved with the work performed in the mill which relates to the preparation of feeds for customers. In general, the feed mill worker operates and maintains mill equipment used in handling and processing feeds; loads and unloads materials and supplies; stores and warehouses materials and supplies; picks up and delivers feeds; prepares feed mixtures; and cleans and maintains the mill buildings and structures. In some firms the feed mill worker may be called a feed grinder or a mill hand.

METHODOLOGY

Objectives were accomplished by constructing an initial task inventory, validating the initial inventory, selecting a sample of workers, collecting data, and analyzing data.

Initial Task Inventory

Duty areas and task statements for the feed mill worker were identified by searching existing task lists, job descriptions, curriculum guides, and reference publications. Additionally, contacts with several industry personnel aided in clarifying the specific responsibilities of the feed mill worker. All the tasks that the project staff thought to be performed were assembled into one composite list.

The initial tasks were grouped into functional areas called "Duties".

After the task statements were grouped under the proper duty areas, each task statement was reviewed for brevity, clarity, and consistency. In all, 206 task statements were included in the initial task inventory.

Initial Inventory Validation

After the initial task inventory was constructed, it was reviewed by ten consultants employed in retail feed mills and country elevators. These consultants were managers or owners of businesses.

The consultants were asked to respond to the initial task list inventory by performing the following activities:

1. Indicate whether any of the tasks listed were not appropriate.
2. Add any additional tasks they believed were performed by the feed mill worker.
3. Make changes in the wording of tasks to help add clarity to the statements.

The comments from the ten consultants were pooled and revisions were made as needed.

As a result of the initial task inventory review process, 135 tasks were identified.

Worker Sample Selection

Since the specific duties and tasks performed by the feed mill worker are related to the size and type of business where employed, an attempt was made to survey feed mill workers employed in various sizes and types of feed businesses. It was not possible to secure a list of the specific names and addresses of all incumbent workers in the state. Therefore, a sample of 75 retail feed businesses was obtained from the 1975 directory of the Ohio Grain, Feed, and Fertilizer Association, Inc. using a stratified random sampling approach. The strata used were type of business and geographical location.

Data Collection

A packet of materials was sent to the owner or manager of the randomly-selected feed mills. The packet of materials included:

1. A cover letter from the Ohio Grain, Feed, and Fertilizer Association, Inc.
2. An employer questionnaire printed on blue.
3. An employee questionnaire printed on yellow.
4. A stamped and self-addressed return envelope.

The manager or owner was instructed to complete the employer questionnaire and to have a responsible feed mill worker complete the employee questionnaire. The manager or owner was instructed to collect the employee questionnaire and return both the employer and employee questionnaire in the stamped and self-addressed return envelope by the date specified in the cover letter.

A follow-up of non-respondents consisted of mailing a packet of materials two weeks after the initial mailing. The first follow-up consisted of a packet of materials identical to the initial packet except that a cover letter on project stationery replaced the cover letter on Ohio Grain, Feed, and Fertilizer Association, Inc. stationery.

A final follow-up of non-respondents was initiated four weeks after the initial mailing. A telephone contact by a project staff member was made with 50% of the non-respondents. The non-respondents were asked to complete the questionnaire and emphasis was placed on the importance of their response to the success of the project during the telephone conversation.

Data Analysis

The 42 questionnaires which were returned were checked for completeness and accuracy by the project staff. Information from the 39 usable responses was coded on Fortran coding sheets for key punching. In addition to coding appropriate respondent-background information, each specific task statement was coded as to whether it was performed (1 = Task performed by respondent; blank = Task not performed by respondent) and the level of importance of the task (3 = Essential; 2 = Useful; 1 = Not Important). The information was keypunched on IBM cards and verified by personnel at the Instruction and Research Computer Center at The Ohio State University.

The data was analyzed using the SOUPAC computer program and the facilities of the Instruction and Research Computer Center. Consultant assistance for analyzing the data was provided by personnel at The Center for Vocational Education.

FINDINGS

Objectives of the study resulted in the compilation of basic sample background information, the determination of tasks performed by the feed mill worker, and the identification of tasks essential to successful performance as a feed mill worker.

Description of the Sample

Information regarding the performance of tasks and the importance of the tasks to successful employment as a feed mill worker was obtained from feed mill workers in various feed mills across Ohio.

Response to the Survey

A total of 75 questionnaires were mailed and 42 replies were received. This represented a 56% rate of return. The response to the questionnaire is summarized in TABLE I.

TABLE I

EMPLOYEE RESPONSE TO THE QUESTIONNAIRE

	N	Percent of All Employees In The Survey
Employees in Survey	75	100.0
Total Returns	42	56.0
Usable Returns	39	52.0
Unusable Returns	3	4.0
Nonrespondents	33	44.0

Size of Business

Feed mill workers from various size retail feed businesses were incluced in the study. The number of full-time equivalent

(two one-half time feed mill workers equal one full-time equivalent) feed mill workers employed in the business was used as an index to assess the size of business where the feed mill worker was employed. Of the 42 questionnaires received, 39 included information regarding the size of the business. TABLE II summarizes the responses to the question, "How many full-time equivalent feed mill workers are employed in your business?" Twelve feed mill workers or 30.8% were employed in businesses employing three to five full-time equivalent feed mill workers. Twelve feed mill workers or 30.8% were employed in businesses employing six to ten full-time equivalent feed mill workers. Nine feed mill workers or 23.1% were employed in businesses employing one to two full-time equivalent feed mill workers. Thus, 84.7% of the feed mill workers were working in firms employing one to ten full-time equivalent feed mill workers. The total number of full-time equivalent feed mill workers employed in the business ranged from 1-22. The average number of full-time equivalent feed mill workers employed in the firms was six.

TABLE II

SIZE OF FEED MILL OR ELEVATOR

Number of Feed Mill Workers Employed in Firm	N	Percent of Respondents
1-2	9	23.1
3-5	12	30.8
6-10	12	30.8
11-15	2	5.1
16 or more	4	10.2
Total	39	100.0

$\bar{X}$ number of feed mill workers in the firm = 6.0

Total Work Experience

Feed mill workers with varying amounts of work experience in the feed industry were included in the study. TABLE III summarizes the responses to the question, "How many total years have you worked in the retail feed industry?" Eleven feed mill workers or 28.2% had from one to five total years of work experience in the feed industry. Eight feed mill workers or 20.5% had 26 or more years of work experience in the feed industry.

TABLE III

TOTAL AMOUNT OF WORK EXPERIENCE IN THE FEED INDUSTRY

Years	N	Percent of Respondents
1-5	11	28.2
6-10	8	20.5
11-15	5	12.8
16-20	3	7.7
21-25	4	10.3
26 or more	8	20.5
Total	39	100.0

$\bar{X}$ years in the industry = 15.5

Eight feed mill workers or 20.5% had from six to ten total years of work experience in the feed industry. The total years of work experience in the feed industry ranged from 1-40 years. Feed mill workers had an average of 15.5 years of total work experience in the feed industry.

Employment at Current Job

Feed mill workers in the survey had spent varying amounts of time at their present job. TABLE IV summarizes the responses to the question, "How many years have you worked at your present job?" Ten feed mill workers or 25.6% had worked at their present job from one to three years. Nine feed mill workers or 23.1% had worked at their present job from four to eight years. Six feed mill workers or 15.4% had worked at their present job from 13-18 years. The years of work at their present job ranged from 1-35 years. Feed mill workers had been employed at their present job an average of 12.6 years.

Preparation as a Feed Mill Worker

Feed mill workers obtained training for their job from various sources. TABLE V summarizes their responses to the question, "Where did you receive your training as a feed mill worker?" Thirty-nine feed mill workers or 100% indicated they received training on-the-job. Five feed mill workers or 12.8% indicated they received training in a high school program.

TABLE IV

LENGTH OF TIME AT PRESENT JOB

Years	N	Percent of Respondents
1-3	10	25.6
4-8	9	23.1
9-12	5	12.8
13-18	6	15.4
19-25	4	10.3
26 or more	5	12.8
Total	39	100.0

$\bar{X}$ years at present job = 12.6

TABLE V

SOURCE OF TRAINING RECEIVED AS A FEED MILL WORKER

Source	N	Percent of All Employees In The Survey
On-The-Job	39	100.0
High School Program	5	12.8
Technical School Program	1	2.6
Adult Education Program	1	2.6
Other	4	10.3

Duty Areas of Work Performed by the Feed Mill Worker

The 135 tasks were grouped under 16 duty areas. Each respondent indicated whether he performed the specific task in his current position as a feed mill worker. The percentages of respondents performing each task were averaged for all tasks under each duty area. The mean percentage of incumbents who performed specific tasks in specified duty areas is presented in TABLE VI.

Duty areas of work in which 50% or more of the incumbent workers performed the tasks were:

1. Assisting in Performing Inventory Activities
2. Following Legal Rules and Regulations
3. Observing General Safety Precautions
4. Planning and Organizing Work
5. Selling Feeds and Other Merchandise
6. Receiving Feedstuffs and Supplies
7. Warehousing Feedstuffs and Supplies
8. Maintaining Feed Mill Equipment and Vehicles
9. Using Hand and Power Tools
10. Operating Feed Mill Equipment and Vehicles
11. Picking Up and Delivering Feed and Merchandise
12. Maintaining Feed Mill Buildings and Structures
13. Formulating Feeds for Livestock
14. Preparing Feed Mixtures in the Feed Mill

Duty Areas of Work Essential for Successful Performance as a Feed Mill Worker

A level of importance rating was obtained for each task. The respondent could rate the task as essential, useful, or not important for successful performance as a feed mill worker. A ranking of essential was assigned a numerical rating of "3", useful a numerical rating of "2", and not important a numerical rating of "1". The level of importance ratings for each task were averaged for all tasks under each duty area. The average level of importance ratings for the specific tasks in the specified duty areas are presented in TABLE VI.

Duty areas of work which received a 2.0 or higher level of importance rating by incumbent workers were:

1. Assisting in Performing Inventory Activities
2. Following Legal Rules and Regulations
3. Observing General Safety Precautions
4. Planning and Organizing Work
5. Selling Feeds and Other Merchandise
6. Receiving Feedstuffs and Supplies
7. Warehousing Feedstuffs and Supplies
8. Maintaining Feed Mill Equipment and Vehicles
9. Using Hand and Power Tools
10. Operating Feed Mill Equipment and Vehicles
11. Picking Up and Delivering Feed and Merchandise
12. Maintaining Feed Mill Buildings and Structures
13. Formulating Feeds for Livestock
14. Preparing Feed Mixtures in the Feed Mill
15. Accounting and Recording Activities

Percentage Performance and Level of Importance Ratings of Specific Tasks

The percentage performance by incumbent workers and the level of importance for each specific task is also presented in TABLE VI.

It is recommended that the results for each specific task be examined by educators and others who are developing educational programs to determine curriculum content for preparing feed mill workers. Specific tasks with a high level of performance and a high level of importance rating should be given more emphasis in the educational program than specific tasks with a low level of performance and a low level of importance rating.

TABLE VI

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE* OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Performing General Office Procedures		
File various forms and records	30	1.6
Use telephone	71	2.3
Write memos and notes	74	2.2
File technical publications	20	1.3
Mean Rating	48.8	1.9
Accounting and Recording Activities		
Record maintenance information on feed mill equipment	51	2.1
Record daily output of processed feed	30	1.8
Record daily input of feed ingredients	35	2.0
Mean Rating	38.7	2.0
Assisting in Performing Inventory Activities		
Assist in taking physical inventory	87	2.6
Determine or estimate by volume inventory on hand	74	2.3
Mean Rating	80.5	2.5
Following Legal Rules and Regulations		
Identify local feed mill policies regarding mixing feed additives	71	2.5
Mean Rating	71.0	2.5
Observing General Safety Precautions		
Follow safe work habits	89	2.7
Identify potential safety hazards	87	2.6
Store chemicals	53	2.1
Use fire extinguishers	76	2.7
Wear appropriate protective clothing	46	2.1
Ventilate work areas	58	2.4
Interpret information on labels	74	2.6

*Average rating of importance may range from 1-3 with 3 being highest

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Use proper lifting and carrying methods	61	2.4
Store inflammable materials	43	2.1
Wear appropriate work clothes	61	2.2
Adjust safety shields	53	2.3
Install safety devices	43	2.2
Correct potential safety hazards	53	2.3
Remove debris from work areas	66	2.7
Use electrical cords and connections safely	76	2.7
Identify safety zones around mill equipment	48	2.4
Mean Rating	61.7	2.4
Planning and Organizing Work		
Establish priorities on various jobs to be completed during the day	74	2.4
Mean Rating	74.0	2.4
Selling Feeds and Other Merchandise		
Explain product information to customers	74	2.4
Greet customers	87	2.7
Interpret customer requests into the manufacturer's product names available	66	2.2
Price products for customers	64	2.1
Take customer's order over telephone	55	2.3
Stock shelves in the sales area	30	1.5
Determine whether product requested is on hand	52	2.1
Differentiate between list price and net price	20	1.4
Mean Rating	56.0	2.1
Receiving Feedstuffs and Supplies		
Check merchandise received against shipping slip	77	2.7
Check materials received for quality	64	2.5
Notate discrepancies, shortages, and damages on shipping slips	72	2.6

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Handle stock to avoid damage	75	2.7
Mean Rating	72.0	2.6
Warehousing Feedstuffs and Supplies		
Remove damaged grain from storage	72	2.6
Control temperature in storage and grain drying areas	62	2.3
Identify problems that might occur during storage	72	2.6
Use proper types of storage facilities	52	2.2
Determine where materials should be stored	79	2.3
Clean storage areas	75	2.7
Use rodent control and pest control materials in storage areas	57	2.4
Label storage areas	25	1.7
Store materials in order of use, season, and convenience	59	2.2
Stack sacked materials	77	2.6
Estimate amount of material in warehouse	69	2.0
Determine amount of storage space needed to store materials and feedstuffs	69	2.2
Determine storability of materials	47	2.0
Unload trucks and rail cars	79	2.4
Move rail cars	50	1.7
Evaluate influence grain moisture has on drying and storage requirements	50	2.1
Determine when grain must be dried	54	2.2
Sample and weigh grain	64	2.2
Take grain moisture test	67	2.4
Check for "hot spots" in grain storage bins	69	2.4
Mean Rating	62.4	2.3
Maintaining Feed Mill Equipment and Vehicles		
Clean debris from equipment	79	2.8
Grease mill equipment	77	2.9
Inflate tires	47	1.9
Install and adjust belts	75	2.7
Install and adjust chains	75	2.7
Interpret maintenance instructions in operator's manuals	72	2.3

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Check and replace bearings and seals in mill equipment	69	2.5
Oil mill equipment	75	2.5
Replace damaged pulleys and sprockets	72	2.6
Reset electrical motors	64	2.4
Lubricate and clean electric motors	62	2.5
Mean Rating	69.7	2.5
Using Hand and Power Tools		
Identify tools	64	2.3
Recondition tools	22	1.5
Select tools for specific jobs	59	2.4
Store tools	59	2.3
Use hand tools safely	62	2.5
Mean Rating	53.2	2.2
Operating Feed Mill Equipment and Vehicles		
Interpret equipment gauge readings	72	2.3
Operate vehicles on public highways	52	2.3
Adjust equipment safety shields	64	2.6
Connect front end operated equipment	25	1.3
Connect 3-point hitch equipment	19	1.3
Hitch towed equipment	42	1.9
Identify potential equipment safety hazards	50	2.3
Install safety shields and devices	50	2.4
Interpret safety and operating instructions in operator's manuals	50	2.4
Interpret safety symbols on equipment	54	2.3
Operate mill equipment under work conditions	75	2.9
Refuel tractors and trucks	52	2.0
Use appropriate equipment for specific jobs	62	2.5
Operate feed preparation equipment at proper RPM	67	2.6
Correct equipment safety hazards	57	2.6
Mean Rating	52.7	2.2

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Picking-up and Delivering Feed and Merchandise		
Complete delivery forms	62	2.1
Select appropriate delivery route	67	2.1
Load vehicles according to load limits	62	2.5
Load and unload bagged feed and supplies	69	2.6
Load and unload bulk truck	72	2.4
Determine where the feed is to be unloaded at the farm	54	2.4
Dump grain into dumping pit	75	2.5
Identify grain to be loaded	75	2.7
Estimate amount of grain by volume measure	54	1.9
Weigh grain on truck	64	2.2
Mean Rating	65.4	2.3
Maintaining Feed Mill Buildings and Structures		
Apply paint	39	1.6
Repair and hang doors	47	1.8
Repair bracing in storage areas and bins	37	1.8
Reset circuit breakers	72	2.4
Replace electrical fuses	84	2.4
Replace light bulbs	79	2.5
Replace window panes	52	2.1
Repair wood panels in storage areas and bins	37	1.8
Repair grain drop spouts	52	2.2
Replace safety screens and grates in dumping areas	47	2.1
Remove trash from work areas	73	2.3
Cut weeds and grass around mill buildings	59	2.2
Clean truck scales	69	2.4
Mean Rating	57.7	2.1
Formulating Feeds for Livestock		
Classify feeds as roughages, grain concentrates, and additives	62	2.3
Determine form in which feed should be prepared	64	2.5
Identify product and brand names	77	2.6
Formulate medicated feeds according to veterinarian's recommendation	59	2.0

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Interpret information on feed tags	69	2.5
Interpret manufacturer's mixing and feeding charts	75	2.5
Mean Rating	67.7	2.4
Preparing Feed Mixtures in the Feed Mill		
Add ingredients to the feed mixture at the proper time and speed during preparation	64	2.6
Adjust preparation equipment according to requirements of order	59	2.3
Change screens	69	2.6
Clean area around preparation equipment	73	2.6
Clean preparation equipment to remove traces of various feed additives used in previous order(s)	62	2.4
Crimp grain	39	1.6
Determine if ingredients are in appropriate form for the feed mixture	67	2.5
Draw off prepared feeds into bags and tie bags	75	2.5
Elevate bulk feeds to truck or storage	75	2.5
Elevate needed ingredients to various preparation equipment	62	2.3
Grind feeds	75	2.8
Interpret mixing and feed preparation directions from customers' orders	77	2.8
Locate appropriate ingredients called for in order	72	2.6
Mix and blend feeds	69	2.6
Pellet feed	25	1.4
Roll grains	32	1.5
Mean Rating	62.2	2.4