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EMPLOYEE COMPENSATION AND JOB SATISFACTION ON DAIRY FARMS IN THE NORTHEAST

Sarah L. Fogleman
Robert A. Milligan
Thomas R. Maloney
Wayne A. Knoblauch

Department of Agricultural, Resource, and Managerial Economics
College of Agriculture and Life Sciences
Cornell University
Ithaca, New York 14853-7801

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PREFACE

This Research Bulletin is the result of Sarah L. Fogleman's Master's thesis research at Cornell University. She is now a faculty member of Kansas State University. Robert A. Milligan, Thomas R. Maloney, and Wayne A. Knoblauch are faculty members in the Department of Agricultural, Resource and Managerial Economics at Cornell University.

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Carol Fisher
357 Warren Hall
Cornell University
Ithaca, NY 14853

Questions should be addressed to Dr. Robert A. Milligan at 607 255-4579 or email: ram18@cornell.edu.

ABSTRACT

As economies of size become fundamentally important in production agriculture, farm sizes continually increase. For dairy producers, this results in larger herds, more acres of crop production, and more full-time, non-owner employees, which result in more human resource management concerns. Research is needed to better understand the human resource aspects of the dairy industry. This research quantifies and illustrates the internal pay structure and enumerates the current employee satisfaction levels present on the farms of members of the Northeast Dairy Producers Association (NEDPA).

To enumerate the study, the NEDPA membership was divided into two groups. The first group consisted of all NEDPA member farms. This group participated in the internal pay portion of the study where an enumerator conducted personal interviews with the farm owner or manager and gathered detailed compensation information for each full-time, non-owner employee. A second, more homogeneous group of farms, those with herd sizes ranging from 500 to 1500 cows, participated in both the internal pay study described above and the employee satisfaction study. On these farms, the owner or manager provided detailed compensation information about the employees, and the employees themselves were interviewed to assess their job satisfaction levels. General managerial and production data were also gathered from the owners or managers at both groups of farms. Personal interviews on 92 farms resulted in compensation data for 709 employees, satisfaction information for 296 employees.

The internal pay structure on these farms was determined from classifications the employers made for each employee with respect to that employee's supervisory capacity, level of decision-making authority, and skill. The data indicate a natural hierarchy related to tenure and education, as the members of each competency level become more experienced and educated from one band to the next. Total compensation values follow the same upward trend with the standard deviations, or depths of the bands, increasing with higher levels of competency.

The pay bands are supported in two regression analyses where total compensation and annual cash wage are each regressed against farm and employee characteristics. The annual wage model has a slightly stronger R-squared value and coefficients that are more consistent with economic theory and a priori information, but both models illustrate several interesting factors consistent with their respective dependent variables. For instance, both models indicate that larger herd sizes translates into higher cash wages and total compensation while the opposite is true with respect to acreage. According to the analyses, each competency level is equivalent to about $3,000 in total compensation.

While the average annual compensation is $27,433, the compensation packages varied with respect to value and complexity. Typically, cash wage constitutes a smaller percentage of the total compensation package with increasing competency levels, demonstrating that upper level employees receive more compensation through benefits and incentives. Health insurance and housing were the compensation

elements that comprised the largest percentage of total compensation next to annual cash wage.

Total Employee Satisfaction was measured through four core dimensions: Autonomy, Variety, Feedback, and Task Identity. While the Total Satisfaction scores are fairly strong, the most interesting result is that Feedback is the core dimension in which employees are least satisfied. Correlating the satisfaction components with variables such as compensation, experience, and demographic factors supports this result. These statistics indicate that Feedback is not associated with wages or other factors but more likely with the amount and quality of communication an employee has with the farm owners or managers.

Many employers utilize some non-traditional compensation techniques. Qualitative observations show that employees enjoy these non-cash benefits but frequently underestimate their values. This is a problem for producers as they compete with seemingly higher wages from other area employers. This concern can be alleviated, again, by good communication between employers and employees about all aspects of the job, including the total value of compensation packages.

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SECTION ONE:

INTRODUCTION

People matter. It is a concept "*Fortune* 500" companies and small businesses alike have been forced to grasp and apply in recent years to maintain a competitive advantage. With the unemployment rate at 4.3 percent, a twenty-eight year low in the United States, attracting and retaining a quality workforce is a significant management concern. Eighty-eight percent of companies say there is a shortage of qualified applicants while 40 percent of employees say they would change jobs for slightly higher pay (Quintanilla). This translates into a very tight labor market where quality workers come at a premium.

The farm manager members of the Northeast Dairy Producers Association recognize the significance of a competitive labor market. Agricultural businesses, dairy farms in particular, have become increasingly dependent upon economies of size. The result is larger herds and, consequently, larger employee bases (New York Agricultural Statistics). Dairy farms do not compete for employees from a homogeneous pool of applicants tailored especially for dairy employment. Rather, potential employees may consider employment alternatives at any number of work organizations ranging from manufacturing, to construction, to sales. Retaining a qualified workforce is increasingly difficult as research indicates that farm workers earn less than employees in other industries (Gisser and Davila).

Dairy managers regularly refer to the recruitment of new employees as one of their biggest management problems (McGonigal). Dairy farm employment has historically had a stereotype of long hours, low pay, and poor working conditions (Cooper). Perceptions like these may deter potential applicants from considering dairy employment.

In short, dairy farms must stay competitive through all aspects of human resource management, including wage rates, benefit packages, and employee relations. Compensation is the leading reason for employees leaving dairy employment, according to two studies conducted in 1953 and in 1983 (Billikopf, 1984). But what constitutes a competitive compensation package, not to mention human resource philosophy? Unfortunately, this information is not readily available. Research on agricultural labor has tended to revolve around the economics, or supply and demand, of the labor market (Gisser and Davila). Accurate benchmark information on wages and benefits for this group is needed.

The members of the Northeast Dairy Producers Association (NEDPA) first examined the internal pay structure of their member farms in the "Farm Employment Project Report" by Dr. Jane W. McGonigal in March of 1998. This survey, sponsored by *American Agriculturist* magazine, NEDPA, Northeast Farm Credit Associations, and PRO-DAIRY, was designed to examine compensation, employee satisfaction, and personnel management factors on 63 NEDPA-member farms.

Overview of the Study

This research is designed to elaborate on the results of the McGonigal study by expanding the sample size to include the entire population of NEDPA members and incorporating additional research objectives. Data for the research were accumulated through personal interviews. Survey questions focused on the total compensation package for each employee, including the employee's job title, job description, educational background, years of experience, and competency level. Farm employers provided internal pay structure information for all full-time, non-owner employees on all NEDPA member farms.

The NEDPA membership was subdivided utilizing the preliminary research assumption was that there is typically one full-time employee for every fifty cows. Farms with herd sizes ranging from 500 to 1500 cows, or between ten and thirty employees, constitute the portion of the population that examines employee satisfaction. On these farms, employers were interviewed about the internal pay structure information outlined above. In addition, employees were interviewed to determine their perceptions about the Variety, Autonomy, Task Identity, and Feedback associated with their jobs and, subsequently, their job satisfaction.

Research Problem Identification

The research problem can be defined as a need for benchmark information about 1) the market value of dairy farm wages and benefits, 2) the satisfaction levels of full-time, non-owner employees of farms, and 3) the relationship pay has with employee job satisfaction. This information is important for dairy employers who wish to become and remain competitive in a tight labor market.

Objectives of the Research

The Northeast Dairy Producers Association, in conjunction with Cornell University's PRO-DAIRY program, has commissioned this research. One possible outcome of the study is that it might be used as an industry handbook that will assist producers when human resource management questions arise in their business practices. In order to develop both a practical handbook and an academic study, the following objectives were established:

- Develop instrumentation for gathering general farm information; total compensation data for all full-time, non-owner farm em
- ployees; and quantify employee satisfaction.
- Conduct personal interviews with NEDPA member employers and employees on NEDPA member farms to gain a fair perspective of the working conditions, company culture, and personal challenges the employers and employees face.
- Develop a competency scale to be used as a mechanism of classifying the employee base.

- Compile a sample of non-cash compensation alternatives.
- Examine the relationships between pay and education, experience, job title, farm size, and competency level.
- Compare compensation rates across farm sizes.
- Examine the correlations that might exist between employee satisfaction and employee and job characteristics.
- Determine the dollar values that might be placed on experience, education, competency and responsibilities in an employees total compensation package.
- Examine employee satisfaction as it relates to the four core dimensions of employee satisfaction: Variety, Autonomy, Task Identity, and Feedback and draw conclusions based on employee and job characteristics.

Overview of Methodology

The methodology involved in this research can be assembled into three categories:

- Development of accurate surveys to capture the desired data.
- Collection of data through personal interviews.
- Data analysis and reporting.

Many methodology concerns typically prevalent in research were not applicable to this topic. Since NEDPA consists of 106 farm members, it was conceivably possible to capture the entire population, therefore alleviating the concern of drawing a random sample.

Three separate surveys were created. One gathered general farm information from the employer. Another survey, completed by the employer, focused on employee compensation by gathering detailed information on employee pay, benefits, job responsibilities, and employee experience. The employees themselves detailed the importance of job attributes and various benefits in addition to providing employee satisfaction information in a separate survey.

Two researchers conducted the personal interviews. One focused on the subset of the population that would only contribute internal pay structure information. At these farms, the owner or manager completed the survey with the enumerator, providing both quantitative data and qualitative observations. Another enumerator, the first author of this research report, visited those farms which would provide data for both the employee satisfaction and internal pay structure surveys. Here, employers completed the internal pay structure survey. The employees were also interviewed to capture their responses to questions pertaining to the importance of different job factors, their job satisfaction levels, and demographic information.

The collected data was then entered into a computing software program and analyzed to meet the goals outlined in previous section.

Outline of Remaining Sections

The remainder of this report offers precise information pertaining to the methodology involved in deriving the report results, specific conclusions for each section and some qualitative comments and observations from the interviews. The report includes the following sections: Introduction, Methodology, Internal Pay Structure, Employee Satisfaction, Links Between Pay and Satisfaction, and Conclusions and Recommendations.

Section Two examines the population and parameters that were included in the survey, reviews the literature which influenced the survey instrument, and illustrates the data collection and analysis. Section Three begins the results portion of the report. The third section presents the internal pay findings, including the structure of the industry wage bands, econometric results, and prevalent industry benchmarks for compensation. Section Four focuses on employee satisfaction. It presents the total satisfaction level for the employees interviewed, as well as breaking that information down according to competency levels. In addition, Section Four examines the importance of various benefit packages to the employees as well as seeing if employers are in-tune with what job attributes are important to their employees. In Section Five, the report examines the links between internal pay structure and employee satisfaction by analyzing the correlations of variables like total compensation and total satisfaction. Section Six describes some of the qualitative observations and conclusions discovered throughout the research, in addition to presenting summaries and suggestions for future research. The appendices provide details from the instrumentation, the qualitative observations from the interviews, and employee recruitment data provided by the employers.

SECTION TWO:
MATERIALS AND METHODS

Given the research objectives outlined in Section One, this section details the methodology used to gather and interpret the data that provides the foundation on which those objectives can be accomplished. First, this section explains the sample determination. Next, each objective is individually analyzed to determine the relevant variables that must be captured in the survey instrument to accomplish each objective. The literature reviewed and pre-testing process are explained to provide justification for the material included on each survey. Finally, the data collection and analysis processes are explained.

Sample Determination

Because of growing employee bases and human resource management concerns, the members of the Northeast Dairy Producers Association were interested in participating in this study of employee compensation and satisfaction. Primary concerns included gathering benchmark information on employee compensation, pay structure, and benefits packages.

The Northeast Dairy Producers Association (NEDPA) is an organization of 106 dairy farms throughout the Northeastern United States. Although their membership in comprised mainly of farms in New York, members are located in Ohio, Pennsylvania, Maryland, New Jersey, Vermont, and Connecticut. NEDPA has a reputation of being an organization of professional, motivated, and successful farm managers. For that reason, it is important to emphasize that although this research may be used for comparison across the dairy production industry, it is not a random sampling of Northeast dairy producers. The objective was to include the entire population of NEDPA members; as a result, a random sampling of dairy producers in the region was not a goal.

The NEDPA membership is diverse. In addition to geographic spread, herd sizes range from 75 to 3000 cows. The number of employee interviews that would have had to be completed on some farms was substantial. Other farms may have had no full-time, non-owner, employees at all. For these reasons, a more homogeneous sample was deemed necessary for the employee satisfaction portion of the survey. Remember from Section One that there were three types of surveys outlined for this study—employee compensation and general farm information that could be provided by the employer and employee satisfaction information to be obtained directly from the employees. According to the NEDPA membership rolls, thirty-five farms have herd sizes ranging from 500 to 1500 cows. These farms constitute the Employee Satisfaction subset of this research.

The Internal Pay Structure data is comprised of detailed total compensation and employee background information for all full-time, non-owner employees at all NEDPA member farms. Because this information was gathered through a personal interview with the farm owner or manager, the entire NEDPA population was a feasible sample for this portion of the survey.

In short, the entire NEDPA population served as the sample for the internal pay structure survey. A subset of that population, specifically, the farms with herd sizes between 500 and 1500 cows extended their participation to included the employee satisfaction portion as well.

The study was limited to full-time, non-owner employees for reasons such as: time and budget constraints; a desire for a homogenous sample of employees that do not have tremendously different work schedules and degrees of ownership in the business; and preferences expressed by NEDPA members. While full-time is a term that is not universally defined, pre-test interviews with producers determined that for the purpose of this study, an employee is to be considered full-time if he or she works at the farm on a regular basis and typically works at least 35 hours per week.

Two enumerators collected data during June, July, and August of 1998. One enumerator focused on the farms with 499 cows or fewer. This group of farms participated in the internal pay structure portion of the survey only. Another enumerator visited the farms whose managers and employees would need to be interviewed (500 to 1500 cows), as well as the very large farms that participated in the internal pay structure survey only (greater than 1500 cows).

Since the internal pay structure information was predominantly quantitative with little room for individual interpretation, there is little chance of enumerator bias in this data. The employee satisfaction data, which has more room for individual interpretation, was enumerated by one individual, the author of this report. However, if the enumerator was unable to interview every full-time, non-owner employee at a farm, another employee was asked to give the missing employee a survey, answer any questions he or she might have, and mail the survey to the researchers by a given date.

Survey Creation

Because of the nature of this research, there was a need for three surveys. A general farm information survey, completed by the farm owner or manager, provided information about the farm and its management. The farm owner or manager also completed the internal pay structure survey and outlined each full-time, non-owner employee's total compensation package. In addition, it assessed information about the factors that contribute to each employee's compensation rate. Finally, an employee survey examined the employees' job satisfaction and opinion about different benefit options and other items of importance relating to their jobs. To eliminate the risk of positioning bias, four different versions of the employee survey were created with questions in different positions on each. Because it is not uncommon for farm

employees to have English as a second language, the employee survey was also translated into a Spanish version.

The general farm survey for all managers interviewed focused on four areas: farm size and performance, farm management, compensation practices, and recruitment procedures. Farm managers whose farms fell into the satisfaction subset also ranked eight items according to their predictions of how important those same items are to their employees. Again, there were three different versions of this survey with the ranking items in different orders on each to eliminate positioning bias. Discussion of those items can be found in the employee survey portion of this section.

Farm size includes herd size in total number of cows, both milking and dry, and total number of tillable acres, both owned and rented. Farm performance is measured in milk production, specifically the Pounds of Milk Sold per Cow in 1997. Farm management information includes years of management and dairy experience in addition to the title of the person being interviewed and the number of years he or she has been in that position.

Compensation information included on this, the general farm information survey, is general, farm-wide information that relates more to farm policy than to an individual employee's compensation package. Topics include whether or not the farm utilizes overtime pay, paid vacation, paid sick leave, health insurance, and retirement plans. Also included are questions regarding offers of meat and milk from the farm for employees. Owners and managers were also asked to list examples of non-cash incentives they might use to improve employee morale and reward employee performance.

The recruitment portion asks the employers or managers to state if they have used a particular recruitment method frequently, sometimes, or never in the past three years. The methods referred to are commonly accepted recruitment processes documented in other research such as word of mouth, referrals from other employees, and advertisements in local newspapers (Maloney and Woodruff).

Much consideration and several pretests were involved in determining the exact information that would be necessary for the internal pay structure survey. Intrinsic to the heart of the problem was the question of what factors influence an employee's base pay and compensation. That is a question that has puzzled economists for two centuries, as wage theorists have vied to explain the determinants of pay. According to the wage theorists, pay is determined by economic variables. Labor economists, however, believe the key lies within non-economic variables. Certainly, psychologists and sociologists have made contributions to compensation theory (Belcher).

While the great economic minds of all time, Malthus, Smith, and Ricardo, to name a few, have pondered this very question, the current literature about compensation rates depicts far more than an economic equilibrium of labor (Belcher). In recent years, factors such as firm profitability, corporate culture, synergy, risk, and survival have all entered into the equation (Gerhart et al). Factors which tend to influence employee pay include job design, technology, the labor market, the presence or absence of unions, and job clusters (Belcher). The primary concern of this research,

however, is not what influences all wages; it is what influences wages for full-time, non-owner employees of NEDPA member farms.

To determine the factors that should be included on the survey, four pretests were conducted where producers spoke candidly about the factors they consider when determining an employee's wage. Many of the factors they listed were easily quantifiable, such as years of experience and educational background. Other factors were not as easy to quantify but could conceivably be captured in a personal interview, such as an individual's job title or key responsibilities. Perhaps the greatest challenge posed by the producers came by way of a statement made when describing one particular employee. The producer said, "I know I could leave the farm for a long time and never worry about it for one second because (that individual) would be here. That's worth a lot to me." The challenge then became capturing that essence.

According to the literature and the pre-test interviews, supervisory capacity, skill level, and decision-making authority are the three key qualities that influence employee compensation levels. Of course, intrinsic in those qualities are such character traits as work ethic, potential to achieve, communication skills, and ability to work with people. The comments of those producers involved in the pretest were used to formulate a competency scale which could capture the "I can leave and not worry about things" factor.

Five competency levels were developed to classify employees according to authority to make decisions, skill level, and supervisory capacity. Every employee in this study was classified as one of the following five competency levels:

> Level One: Employees who are either very new to the farm or have no advanced skills. They are, for example, individuals who are given their tasks by another person and then perform miscellaneous jobs that require no previous training or experience. This level can also include people who are in training for skill-specific positions such as milker but who have not yet acquired those skills.
>
> Level Two: Very specialized individuals who perform anywhere from one to many specific tasks which require training. Although these employees may make personal decisions such as the order in which to perform certain tasks, they do not have the authority to make decisions relating to their job responsibilities, area of production, or coworkers. As a result, they have no supervisory authority. An example of a Level Two employee would be a machinery operator who is very good at his or her job but does not determine when to harvest.
>
> Level Three: Employees who are very skilled in at least one specified area. These employees may make decisions related to his or her area of expertise and may administer those decisions through other employees, therefore giving a Level Three employee some supervisory capacity. However, this person's decision-making authority does not extend into other areas of the operation.

An example of a Level Three employee is a feeder who makes all feeding decisions but does not determine the rations or what crops to plant.

Level Four: Because of his or her exceptional skill level, this person is in a position to make decisions which impact entire areas of the operation. Many employees could have to carry out those decisions, giving this person a potentially large supervisory authority. However, a Level Four employee's decision-making authority and supervisory capacity does not cover the entire farming operation. This person's input could affect other areas, but the ultimate decision is not his or hers.

Level Five: Level Five employees are the most skilled and qualified full time employees with a farm. They have complete supervisory authority and the most decision-making authority given to any full time employee.

The competency scale gives another angle from which to approach internal pay structure. Typically, pay structure is categorized according to job title. With competency level information, each employee can be cross-referenced by job title and competency level or studied solely within either category. The competency level approach seen here is one type of the very popular "Broadbanding" compensation mechanism by which employees of similar skill levels or competency are taken together in compensation "bands", regardless of job title. These bands then, theoretically, compensate like employees at like rates across the entire organization. This is very popular in companies that have incorporated skill-based pay into their compensation philosophy. The bands typically serve to maintain both internal and external equity. Internal equity ensures that people of like skills and abilities are compensated fairly relative to each other while external equity maintains fairness across the labor market, or specifically with the industry. Surveys such as this are a very popular method of developing compensation levels and wage structures to help maintain external equity (Schuler).

During the pretests, employers provided listings of job titles and key responsibilities found in their operations. This information served as the basis for the list of job titles and responsibilities included in the survey. The responsibilities hinged around subsets of skills or knowledge required for the jobs. For example, an individual who scrapes barns and drives a truck during harvest might be classified as a General Farm Worker whose key responsibility is operating machinery.

Finally, this survey required the compensation information itself, not just information that explains what the compensation rate should be. For data analysis purposes, precise information for each compensation element was preferred over lump compensation information. The compensation elements are the annual cash wage, the average hours worked per week, the annual house rental value paid by the employer, the annual health insurance value paid by the employer, the employer contribution to the employee's retirement plan, and any additional bonuses or perks that might have a cash value. In addition, the survey determined if the employee was paid on an hourly

or salaried basis, what the hourly wage was, if applicable, and if the employee worked a day, night, or swing shift.

This information was included in an econometric data analysis, particularly a least squares regression analysis. This type of analysis, Point Factor Theory, is commonly used in compensation studies to value particular employee or job attributes. (Belcher)

For the employee satisfaction survey, literature was useful when deciding how to determine an employee's satisfaction level. The satisfaction survey instrument hinged on four core dimensions of job satisfaction—Feedback, Autonomy, Variety, and Task Identity (Lawler). Four questions were designed to capture an employee's opinion on each of the core dimensions with the intent of compiling those responses to develop a measurement of total satisfaction and satisfaction for each dimension.

The Feedback questions hinged on the quantity and quality of job evaluation given to the employee by the owner or manager. It also evaluated the employee's access to job performance mechanisms (such as somatic cell count) that have employee evaluation intrinsic in them (Lawler).

According to Lawler, "The job must allow a worker to feel personally responsible for a meaningful portion of his work." This sense of Autonomy was measured in the employee survey by asking questions of the employees about their ownership of their work and the degree of authority they have over how they perform their tasks (Lawler).

Task Identity is defined as, "a very clear cycle of perceived closure and high visibility of the finished product." For the purposes of this research, the Task Identity questions presented to these employees regarded a perception of where the employee fits into the larger farm scheme (Lawler).

The instrument was also designed to measure an employee's perception of the amount of Variety present in his or her job. According to the Lawler literature, "high Variety jobs typically tap a number of different skills that may be important to the employee." It is important to stress the element of challenge, not just difference when evaluating Variety. If an employee performs different tasks that use the same skill sets and none of those tasks challenge the employee, that job, for that employee, is low on variety (Lawler).

An original objective of this research was to determine if employers are truly in-tune with what their employees feel are important. To evaluate this, a priori information and examples from previous research aided in developing a list of eight items believed to be important to the employees on these farms with the hypothesis that employers would not be able to predict the items the employees felt were most important (Milligan and Maloney). These same items were presented to the employers whose employees participated in the satisfaction study. The employers were asked to predict the rankings of their employees. In addition, employees were presented a list of compensation elements and asked to rank those items in order of importance.

Data Analysis

The entire data set was entered into Microsoft Excel Spreadsheets. The data sets were then cross-sectioned into different groups for analysis. The employer information was analyzed to determine three subsets of farm sizes, then the employer data was cross-sectioned into those three groupings. The internal pay data was grouped as follows: all employees; employees by competency level; employees by farm size; employees by competency level and farm size. The satisfaction information was grouped as all employees and employees by competency level.

These groupings of data provided all the quantitative information presented in the following sections. Most of that data were compiled and interpreted through the Microsoft Excel package. Because of the size of the data set, however, an econometric software package, Econometric Views, was necessary for the regression analyses.

SECTION THREE:

INTERNAL PAY STRUCTURE

Introduction

A primary objective of this research is to determine the internal pay structure on NEDPA member farms. This section provides an overview of the farms visited and managers interviewed for this study in order to qualify the standards and results given. Also, descriptive information about the employees facilitates an understanding of the employees represented on these farms. Dividing the employees into competency levels provides the framework for compensation bands and an analysis of the various aspects or components of compensation between employees with similar levels of responsibility, authority, and skill. Compensation models illustrate the values placed on each of the components that determine the value of an employee's compensation package and annual wage. Finally, employee compensation is examined according to farm size.

Descriptive Information—The Farms

In order to maintain the integrity of the data and to compare the results listed here with other industries or farms, it is important to understand the characteristics of the farms included in this portion of the study. Steps were taken to capture the entire population of NEDPA member farms. Every farm had an opportunity to participate in the study but some producers were unable to take part. In total, this data represent interviews on 88 percent of the NEDPA farm members. These 93 farms provided internal pay information for a total of 709 full-time, non-owner dairy employees.

It is important to emphasize, once again, that this is not intended to be a random sampling of dairy operations in the Northeast. This study deals with a very specific and progressive subset of the dairy industry. The NEDPA membership, on average, is comprised of farms with far larger herd sizes, and therefore, employee bases (New York Agricultural Statistics). In addition, NEDPA farms have far higher production figures than industry averages for New York State, where 90 percent of the NEDPA membership is located. To clarify this point, please consider the information available in Table 3.1.

Table 3.1 NEDPA Membership Herd and Production Averages as Compared to Averages for all New York Dairy Farms

	NEDPA Membership	New York State Average[1]
Annual Pounds of Milk per Cow	22,545[2]	16,519
Average number of Cows	537	81

[1]Based on New York Agricultural Statistics, 1997-1998
[2]1997 Pounds of Milk Sold per Cow

The managers interviewed in this study have, on average, 20 years of experience in management and 26 years of dairy experience. On some farms, the management has initiated complex compensation packages that extend far beyond a cash wage. Employers were asked if they provided any of an extensive list of compensation elements, including health insurance, retirement programs, housing, and incentive programs (Table 3.2). This table also provides information for farms as members of three size subsets, determined by grouping farms of similar herd sizes according to the number of cows listed during the general farm survey and allowing nearly equal number of farms in each category.

Table 3.2 The Percentage of NEDPA Member Farms Providing Each Compensation Element

	All Farms n=92	0-299 Cows n=27	300-549 Cows n=33	550-3400 Cows n=32
Health Insurance	79%	69%	76%	90%
Retirement Plan[1]	53	28	52	75
Housing	65	48	64	75
Ag Products[2]	74	70	79	72
Paid Vacation	92	81	94	100
Paid Sick Leave	53	64	45	53
Bonuses	65	33	61	97

[1] Includes Retirement Plans with Contributions from the Employee Only, Employer Only, and Employer and Employee Jointly Contributing
[2] Agricultural Products are defined as Milk or Meat provided for the employees by the farm at no charge

Note the prevalence of paid vacation, agricultural products, and health insurance as benefits on all farms. Also interesting is the variation of these elements across the study according to farm size. This information demonstrates the trend toward more complex compensation packages with larger farms. It does not indicate the values of the total compensation packages found on farms of different sizes, just the percentages of farms in each category that offer or provide various compensation types.

Descriptive Information—The Employees

Before examining the employee compensation data, it is important to understand the employees as a whole. Factors determined to be both quantifiable and significant in an employee's wage are outlined in Table 3.3.

Table 3.3 Demographic Employee Information for All Employees

	Mean/ Percentage	Standard Deviation	Sample Size[1]
Experience			
Years Experience	12	11.31	660
Years on Farm	5	6.72	706
Years in Current Position	3.7	4.81	706
Educational			
Some HS Education	14%	.35	630
High School Degree	56%	.49	630
Some College Education	10%	.49	630
Associate's Degree	10%	.3	630
Bachelor's Degree	10%	.30	630
Pay System			
Paid on a Salary Basis	25%	.44	709
Paid on an Hourly Basis	75%	.56	709
Shift			
Day Shift	72%	.45	707
Night Shift	17%	.38	707
Swing Shift	9%	.30	706
Hours Worked per Week	56	9.64	708

[1] Sample Size is the number of employees for which that data was collected.

This information provides an insight into the types of employees attracted and retained by NEDPA member farms. On average, these employees have 12 years of experience in the dairy industry with five of those years being with their current employer. This fact translates into a 20 percent turnover ratio for these operations. Seventy-one percent of these employees completed no education beyond high school. Seventy-five percent of the employees in the study work on an hourly wage system. Despite the prevalence of twenty-four hour milking operations, 72 percent of all employees work day shifts only. One of the most significant and interesting facts is that on average, these employees work 56 hours per week. Keep in mind, this information is representative of all full-time, non-owner employees at the participating NEDPA member farms described in the previous section.

Compensation for All Employees

The average total compensation for NEDPA member farm employees is $27,433. This includes the employee's annual cash wage plus the annual value of any housing, insurance, retirement benefits, and any other benefits or perks that would have a cash value like bonuses or company vehicles. Table 3.4 provides a breakdown on the average total value of these compensation elements across the entire sample of 709 employees at all NEDPA member farms surveyed through this research.

Table 3.4 Annual Compensation Values for All Employees

	Mean	Standard Deviation	Sample Size[1]	% of Employees Receiving
Total Compensation[2]	$27,433	$8,100	709	---
Annual Cash Wage	22,939	6,254	709	100
Health Insurance	3,070	1,666	371	52
Housing	5,283	2,470	210	30
Retirement	1,170	909	193	27
Other Benefits	1,970	2,221	383	54

[1]The number of employees receiving the compensation element.
[2]Total Compensation = Annual Cash Wage + Annual Health Insurance Value + Annual Housing Value + Annual Retirement Benefits + Annual Cash Value of Any Other Benefits or Perks

It is interesting to note the prevalence of different compensation components. Some farms utilize very complex compensation packages. Eighty-two percent of these employees receive some form of compensation above their base or cash wage. Bonuses and non-cash incentives are a very popular practice on these farms. In fact, 53 percent of employees included in this survey received either bonuses (like quality bonuses) or non-cash incentives (like farm vehicles). These additional perks were valued at, on average, $1,970. The most prevalent non-cash compensation element was health insurance, with 52 percent of employees receiving farm-sponsored health insurance benefits. Thirty percent of these employees receive farm provided housing of some kind, while 27 percent participate in a retirement program. These numbers illustrate the employers' concerns with remaining competitive in labor markets. Advanced compensation packages are raising the bar for dairy employment standards. A breakdown of how important each of these compensation elements is to the employees can be found in Section Four of this report.

While the average annual compensation figures are a good benchmarking tool, they do not provide an entirely accurate picture of compensation on these farms. Note from Table 3.3 that the average hours worked per week per employee is 56 with a

standard deviation of 9.64. To consider total compensation relative to the amount of time worked, it is also helpful to examine the total compensation per hour. The average employee receives a compensation equivalence of $9.51 per hour in cash wages and other compensation (Table 3.5).

Table 3.5 Total Compensation per Hour for All Employees

	Value Per Hour	Standard Deviation	Sample Size
Total Compensation	$9.51	$2.45	709
Hourly Wage	7.97	1.57	516
Hourly Wage Equivalent[1]	7.96	1.74	709

[1] Includes Wage per Hour for employees paid on an hourly and salaried basis where the annual salary is divided by average hours worked per week

Table 3.5 indicates a small, if not nominal, difference between the average hourly wage and the average hourly wage equivalent. To understand this difference, the employee data set was divided according to whether an employee is paid an annual salary or an hourly wage. Those two groups were then sub-divided according to competency level (Table 3.6). This data indicates that employees are paid annual salaries more frequently in higher competency levels. Employees in competency levels one and two who are paid on an hourly basis have higher hourly wage equivalents than salaried employees in the same competency levels. The reverse is true within levels three, four, and five. While the hourly values become more different, the total compensation values remain very close for both groups of employees.

Table 3.6 Compensation for Hourly and Salaried Employees

	Hourly Wage Equivalent	Hours Worked per Week	Annual Cash Wage	Annual Total Compensation
All Salaried	$7.90	57.5	$23,225	$29,972
N=173[1]	2.16[2]	9.8[2]	$6,452[2]	$8,486[2]
All Hourly	7.98	55.1	22,894	26,661
N=527	1.58	9.5	6,204	7,853
Level 1 Salaried	7.44	56.8	20,320	22,256
N=7	$2.89	14.2	$3,756	$5,233
Level 1 Hourly	6.89	55.3	19,704	21,653
N=65	0.95	10.2	4,072	4,360
Level 2 Salaried	7.31	54.1	19,965	25,143
N=53	1.90	9.8	4,158	4,755
Level 2 Hourly	7.38	53.6	20,577	24,080
N=65	1.10	9.2	4,754	5,878
Level 3 Salaried	7.89	57.4	23,271	30,036
N=61	2.06	9.4	6,341	7,154
Level 3 Hourly	8.29	55.0	23,746	27,623
N=174	1.30	10.1	5,825	7,555
Level 4 Salaried	8.80	59.2	26,801	34,469
N=34	1.96	7.72	5,865	8,770
Level 4 Hourly	9.46	58.7	28,711	34,128
N=79	1.87	7.12	6,000	7,805
Level 5 Salaried	8.49	65.4	28,814	38,942
N=16	2.79	8.8	8,460	10,731
Level 5 Hourly	10.22	61.9	32,369	38,653
N=8	3.51	8.1	9,404	7,748

[1]Number of Employees
[2]Standard Deviation

Pay Bands

While the aggregate compensation data from the previous section is interesting and could be useful when comparing dairy with other industries, it does not offer sufficient general applications for the industry itself. Determining the "average" employee would be a task more academic than practical in nature. An objective of this study is to provide a useful tool for examining compensation practices and a more simplified standard of comparison for like employees. Therefore, the bands illustrated

in this section reflect the ranges of total compensation prevalent within each employee competency level.

As laid out in the methodology, employers were asked to classify each employee as one of five competency levels. These levels provide the framework for pay bands, an instrument through which we can compare the compensation for employees with similar skill levels, degrees of supervisory authority, and decision-making capacity. First, consider the general employee characteristics exhibited within each band (Table 3.7).

Table 3.7 Employee Characteristics by Competency Level

	Level 1	Level 2	Level 3	Level 4	Level 5
Experience					
Years Experience	6.5	8.93	14.7	14.8	20.8
	11.7[1]	9.86	12.1	8.9	11.6
	67[2]	239	212	108	21
Years on Farm	2.9	3.34	5.6	7.4	12.38
	7.7	4.3	5.8	8.9	10.7
	70	248	238	115	22
Years in Current Position	2.1	2.68	4.2	5.3	5.6
	5.1	3.5	4.7	5.7	6.2
	70	248	238	115	22
Education					
Some High School	28%	20%	13%	2%	---
	.45	.40	.33	.13	0
	57	215	213	109	24
High School Degree	67%	64%	58%	39%	46%
	.48	.48	.50	.49	.50
	57	215	213	109	24
Some College	---	12%	11%	9%	17%
	0	.72	.31	.29	.38
	57	215	213	109	24
Associate's Degree	.04	.04	11%	22%	17%
	.19	.20	.31	.42	.38
	57	215	213	109	24
Bachelor's Degree	---	.04	8%	27%	21%
	0	.19	.27	.44	.41
	57	215	213	109	24
Master's Degree	---	---	---	1%	---
	0	0	0	.10	0
	57	215	213	109	24
Pay System					
Paid on a Salary Basis	10%	21%	26%	30%	67%
	.29	.41	.44	.46	.48
	72	254	235	113	24

Table 3.7 (Continued)

Paid an Hourly Wage	90%	79%	78%	70%	33%
	.29	.41	.75	.46	.48
	72	254	235	113	24
Shift					
Day Shift	60%	64%	78%	81%	83%
	.49	.48	.41	.39	.38
	72	253	234	113	24
Night Shift	29%	20%	16%	10%	4%
	.46	.40	.34	.30	.20
	72	253	234	113	24
Swing Shift	11%	15%	6%	9%	13%
	.31	.36	.24	.29	.34
	72	253	233	113	24
Hours Worked per Week	55	54	55	59	64
	10.5	9.34	10.0	7.3	8.6
	72	255	238	116	24

[1]Standard Deviation
[2]Sample Size

Cross sectioning the employee base by these competency levels illustrates differences in the general make-up of each level with respect to the descriptive statistics outlined for the total population. We are able to determine that employees are, on average, less educated and experienced at the first level. These factors increase throughout each subsequent level. This upward trend in education and experience coincides with predictions based on the criteria that defines the competency groupings. These levels illustrate the progression of employees through the ranks of farm management in addition to the impact educational degrees can have on an individual's degree of skill, supervisory authority, and capacity to make decisions.

Note the distribution of employees throughout the competency levels. As expected, the majority of full-time, non-owner employees are classified within the second and third levels. Therefore, it is important to remember the smaller sample sizes used in determining data for levels one, four and five when analyzing statistical information.

Considering the employee characteristics outlined in Table 3.7, we can relate that information to the average total compensation for each employee group. Table 3.8 provides total compensation information for each competency level. As with the compensation information for the general sample, these figures reflect the total of annual cash wage, annual housing value, annual health insurance value, annual value of any other perks or incentives, and the value of any retirement programs contributed to for an employee by the farm. Note that while the total compensation, cash wage, and hourly wage averages increase steadily throughout the competency levels, the compensation elements do not increase as consistently, indicating that the forms in which employees receive their compensation have more variation between competency levels.

Table 3.8 Average Annual Employee Compensation by Level

	Level 1	Level 2	Level 3	Level 4	Level 5
Total Compensation	$21,712	$24,315	$28,123	$34,083	$38,847
	4414[1]	5662	7553	8019	9664
	72[2]	255	238	116	24
Annual Cash Wage	19,764	20,471	23,544	28,095	29,579
	4022	4638	5961	5938	8812
	72	255	238	116	24
Health Insurance	2966	2863	3014	3252	3777
	1874	1583	1655	1828	1683
	17	117	136	74	16
Housing	3737	5120	5551	5273	7166
	750	2365	3149	1315	2819
	16	71	64	42	12
Retirement	949	831	1229	1404	1626
	369	317	1027	1012	1184
	7	50	76	48	10
Other Benefits	900	1805	1764	2464	3317
	821	2006	1654	3203	2172
	26	133	131	67	18
Hourly Wage[3]	6.95	7.37	8.19	9.26	9.07
	1.24	1.30	1.53	1.89	3.09
	72	255	238	79	24

[1]Standard Deviation
[2]Number of Observations
[3]Hourly Wage Equivalent = Pay per hour for hourly and salaried employees

The statistical significance of these means is shown in Table 3.9. This table illustrates whether the mean values of total compensation for each competency level were statistically different from each other at the .50 level.

Table 3.9 Statistical Significance of the Mean Values of Total Compensation

	Level 1	Level 2	Level 3	Level 4
Level 2	No			
Level 3	Yes	No		
Level 4	Yes	Yes	No	
Level 5	Yes	Yes	Yes	No

It is not unexpected that the total annual compensation averages increased successively for each level. Likewise, it is not unusual to find overlap or instances when employees in lower bands are compensated at a higher level than some individuals in a higher classification. Therefore, it is safe to conclude that while, on

average, employees are compensated better at higher levels, this is not true for all individuals. Perhaps this is best illustrated through the use of wage bands.

Taking the averages for each level and expanding them by one standard deviation creates wage bands that contain 68 percent of the total compensation values for each level. This illustrates the standard ranges of compensation for like groups of employees. Certainly, the actual compensation values within each competency level extend beyond the bands illustrated in Figure 3.1, but these bands are intended to illustrate the moderate values, independent of outliers.

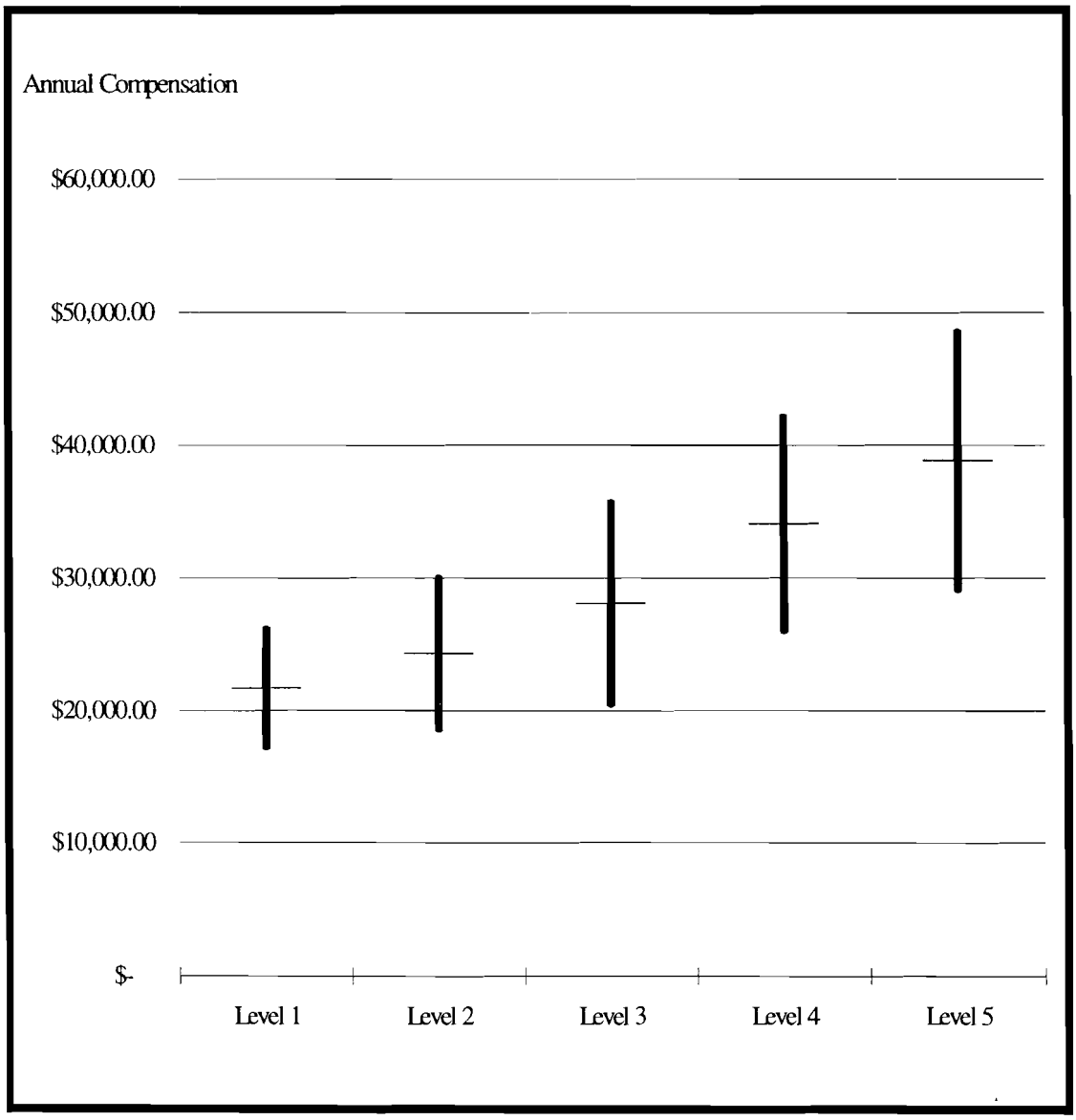

Figure 3.1 Total Annual Compensation Pay Bands for Employees by Competency Level

It is interesting to note not only the increase in the stair-stepped pattern of compensation represented by each band, but also the ranges or depths of the bands. It seems the ranges of compensation increase from level to level, thus allowing more spread between the highest and least compensated employees of each grouping. The smallest spread of any competency level is in Level One employees, demonstrating that compensation for these employees is more consistent than for employees with higher competency classifications. The data indicates a variation in the types of compensation received between bands. As related in Table 3.10, the percentage of total compensation received through cash wages decreases between the lower and higher competency levels.

Table 3.10 Compensation Elements as a Percentage of Total Compensation for Employees by Competency Level

	Level 1 N=72	Level 2 N=255	Level 3 N=238	Level 4 N=116	Level 5 N=24
Cash Wage	91.7[1]	85.6	85.3	83.8	76.2
	.10[2]	.135	.1298	.118	.1304
Health Insurance	3.1	5.0	5.8	6.3	5.8
	.0665	.0139	.0640	.0573	.0566
Housing	3.4	5.1	4.5	5.3	9.6
	.0647	.0921	.0852	.0740	.1118
Retirement	0.4	0.6	1.3	1.6	1.4
	.0123	.0140	.0241	.0253	.0227
Other Benefits	1.6	3.6	3.2	3.5	6.5
	.032	.0616	.0451	.0589	.0727

[1]Mean Value
[2]Standard Deviation

For Level One employees, 92 percent of the total compensation value is in cash wages, more than any other competency level. While this indicates that Level One employees receive fewer benefits than higher level employees, this is not unexpected. As noted earlier, farm tenure is usually higher within the higher competency levels. After a designated period with each individual farm, it is possible that the Level One employees will become eligible for the farm's complete benefit package. So, in short, while the compensation rate for employees increases with each competency level, the portion of compensation that comes through cash wages decreases.

The portion of total compensation accounted for by cash wages is very close for employees in levels two, three, and four, while it decreases slightly with values of 86, 85, and 84 percent, respectively. There is an eight-percent drop in cash wage as a portion of total compensation between employees in levels four and five. Twenty-four percent of the total compensation of Level Five employees is through non-wage

mediums. This indicates a trend in business to compensate high-level managers through a variety of methods such as profit sharing.

As illustrated in Table 3.8, annual cash wage for each competency level follows much the same pattern demonstrated by total compensation data. Note that while the pay level increases across the competency areas, the incremental increases are much slighter, thus further demonstrating that higher level employees are compensated progressively less through cash wages as they progress through the stages of management.

Remember from the descriptive statistics outlined in Table 3.7, that employees in each band are working relatively similar numbers of hours each week with the exception of employees in levels four and five who average 59 and 64 hours of work per week, respectively. But consider that 70 percent of Level Four employees are paid on an hourly basis, compared to only 33 percent of Level Five employees. This results in Level Five employees earning less per hour than Level Four employees earn. Still, when an hourly compensation figure is compared to this, Level Five employees are still compensated at a higher rate.

The Compensation Model

Now that the compensation averages and ranges for the entire sample of NEDPA full-time, non-owner employees have been examined, the factors that determine the compensation framework are analyzed. Pre-test interviews established that employers consider many factors when determining an employee's compensation. The main criteria mentioned were as follows: experience, education, what was later determined to be competency level, job title, and key responsibilities. This list was expanded, due to economic factors, to include the local area unemployment rates and farm size. This portion of the study quantifies these factors through a mathematical equation, or model, that can be used to calculate compensation values for an individual employee, considering the standards set by the sample of NEDPA member farms.

Consider the following model:

$$
\begin{aligned}
\text{TOTALCOMP}_i = {} & \beta_1 + \beta_2\,\text{HRSWEEK}_i + \beta_3\,\text{ACRES}_i + \beta_4\text{COWS}_i + \beta_5\text{SOMEHS}_i + \\
& \beta_6\text{AS}_i + \beta_7\text{SOMECOLL}_i + \beta_8\text{BS}_i + \beta_9\text{MS}_i + \beta_{10}\text{ASSTHM}_i + \beta_{11}\text{BARNMGR}_i + \\
& \beta_{12}\text{CALFMGR}_i + \beta_{13}\text{CROPSMGR}_i + \beta_{14}\text{FEEDER}_i + \beta_{15}\text{GENFARM}_i + \\
& \beta_{16}\text{HEIFERMGR}_i + \beta_{17}\text{HERDMGR}_i + \beta_{18}\text{MACHOPR}_i + \beta_{19}\text{MECHANIC}_i + \\
& \beta_{20}\text{MILKINGMGR}_i + \beta_{21}\text{NIGHT}_i + \beta_{22}\text{SWING}_i + \beta_{23}\text{BREEDING}_i + \\
& \beta_{24}\text{CALFMGMT}_i + \beta_{25}\text{CHEMICALS}_i + \beta_{26}\text{CROPMGR} + \beta_{27}\text{FEEDING}_i + \\
& \beta_{28}\text{GENCROPWORK}_i + \beta_{29}\text{GENHERDWORK}_i + \beta_{30}\text{HEATDET}_i + \\
& \beta_{31}\text{HEIFERMGMT}_i + \beta_{32}\text{HERDHEALTH}_i + \beta_{33}\text{HERDMGMT}_i + \\
& \beta_{34}\text{HERDHEALTH}_i + \beta_{35}\text{HERDMGMT}_i + \beta_{36}\text{MACHREPAIR}_i + \\
& \beta_{37}\text{MAINTENANCE}_i + \beta_{38}\text{MANUREMGMT}_i + \beta_{39}\text{MILKING}_i + \beta_{40}\text{OPRMACH}_i + \\
& \beta_{41}\text{RECORDS}_i + \beta_{42}\text{SCHEDULING}_i + \beta_{43}\text{SILOMGMT}_i + \beta_{44}\text{SOILMGMT}_i + \\
& \beta_{45}\text{TRAINING}_i + \beta_{46}\text{UNEMPLOYMENT}_i + \beta_{47}\text{YRSEXP}_i + \beta_{48}\text{YRSFARM}_i +
\end{aligned}
$$

$\beta_{49}YRSPOSITION_i + \beta_{50}LEVEL2_i + \beta_{51}LEVEL3_i + \beta_{52}LEVEL4_i + \beta_{53}LEVEL5_i + \beta_{54}SALARIED_i + \varepsilon_i$

Where the variables are defined as follows:

$HRSWEEK_i$ = The average number of hours worked per week for employee $_i$
$ACRES_i$ = The number of tillable acres, both owned and rented, for the farm
$COWS_i$ = The total number of cows, both milking and dry, for the farm
$SOMEHS_i$ = The highest educational level achieved is some high school
AS_i = The highest educational level achieved is an Associate's Degree
$SOMECOLL_i$ = The highest educational level achieved is some college
BS_i = The highest educational level achieved is a Bachelor's Degree
MS_i = The highest educational level achieved is a Master's Degree
$ASSTHM_i$ = The job title of Employee $_i$ is Assistant Herd Manager
$BARNMGR_i$ = The job title of Employee $_i$ is Barn Manager
$CALFMGR_i$ = The job title of Employee $_i$ is Calf Manager
$CROPSMGR_i$ = The job title of Employee $_i$ is Crops Manager
$FEEDER_i$ = The job title of Employee $_i$ is Feeder
$GENFARM_i$ = The job title of Employee $_i$ is General Farm Worker
$HEIFERMGR_i$ = The job title of Employee $_i$ is Heifer Manager
$HERDMGR_i$ = The job title of Employee $_i$ is Herd Manager
$MACHOPR_i$ = The job title of Employee $_i$ is Machinery Operator
$MECHANIC_i$ = The job title of Employee $_i$ is Mechanic
$MILKINGMGR_i$ = The job title of Employee $_i$ is Milking Manager
$NIGHT_i$ = Employee $_i$ works a Night shift
$SWING_i$ = Employee $_i$ works a Swing shift
$BREEDING_i$ = One of the key job responsibilities for Employee $_i$ is Breeding
$CALFMGMT_i$ = One of the key job responsibilities for Employee $_i$ is Calf Management
$CHEMICALS_i$ = One of the key job responsibilities for Employee $_i$ is Applying Chemicals
$CROPMGMT_i$ = One of the key job responsibilities for Employee $_i$ is Crop Management
$FEEDING_i$ = One of the key job responsibilities for Employee $_i$ is Feeding
$GENCROPWORK_i$ = One of the key job responsibilities for Employee $_i$ is General Crop Work
$GENHERDWORK_i$ = One of the key job responsibilities for Employee $_i$ is General Herd Work
$HEATDET_i$ = One of the key job responsibilities for Employee $_i$ is Heat Detection
$HEIFERMGMT_i$ = One of the key job responsibilities for Employee $_i$ is Heifer Management
$HERDHEALTH_i$ = One of the key job responsibilities for Employee $_i$ is Herd Health
$HERDMGMT_i$ = One of the key job responsibilities for Employee $_i$ is Herd Management

$MACHREPAIR_i$ = One of the key job responsibilities for Employee $_i$ is Machinery Repair
$MAINTENANCE_i$ = One of the key job responsibilities for Employee $_i$ is Facility Maintenance

$MANUREMGMT_i$ = One of the key job responsibilities for Employee $_i$ is Manure Management
$MILKING_i$ = One of the key job responsibilities for Employee $_i$ is Milking
$OPRMACH_i$ = One of the key job responsibilities for Employee $_i$ is Operating Machinery
$RECORDS_i$ = One of the key job responsibilities for Employee $_i$ is Record Keeping
$SCHEDULING_i$ = One of the key job responsibilities for Employee $_i$ is Scheduling
$SILOMGMT_i$ = One of the key job responsibilities for Employee $_i$ is Silo Management
$SOILMGMT_i$ = One of the key job responsibilities for Employee $_i$ is Soil Management
$TRAINING_i$ = One of the key job responsibilities for Employee $_i$ is Training Other Employees
$UNEMPLOYMENT_i$ = The Unemployment rate for the farm's county for June 1998 as provided by the Bureau of Labor Statistics
$PRIOREXP_i$ = The number of years Employee $_i$ has worked on other farms
$PRIORFARM_i$ = The number of years Employee $_i$ has worked on the current farm in a position other than his/her current position
$YRSPOSITION_i$ = The number of years Employee $_i$ has worked in his/her current position
$LEVEL2_i$ = Employee $_i$ is a member of Competency Level Two
$LEVEL3_i$ = Employee $_i$ is a member of Competency Level Three
$LEVEL4_i$ = Employee $_i$ is a member of Competency Level Four
$LEVEL5_i$ = Employee $_i$ is a member of Competency Level Five
$SALARIED_i$ = Employee $_i$ is paid on a salary basis

These factors were included in an Ordinary Least Squares regression analysis with Total Compensation as the dependent variable. Some variables were excluded from the model to correctly include dummy variables.

The base, or omitted, variables were chosen because they were typically the most common attributes of the employees in this survey or, in the case of competency level, they are the inherently lowest variable. For the purpose of this regression, the base employee has the job title of milker, completed a High School Degree, works a day shift, is paid an hourly wage, and is a Competency Level One Employee.

The Ordinary Least Squares Regression results in the following statistical information (Table 3.11).

Table 3.11 Regression Analysis Results for the Total Compensation Model

Dependent Variable is TOTALCOMP			
Sample(adjusted): 1 - 708			
Included observations: 592			
Excluded observations: 116 after adjusting endpoints			
R-squared	0.602014	F-statistic	16.01633
Adjusted R-squared	0.564427	Prob(F-statistic)	0

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	2192.74	2077.338	1.056	0.2916
HRSWEEK	346.36	28.310	12.235	0.0000
Size Variables				
ACRES	-1.91	0.480	-4.000	0.0001
COWS	3.86	0.605	6.384	0.0000
Education Variables				
SOMEHS	360.70	681.654	0.529	0.5969
AS	605.35	840.255	0.720	0.4716
SOMECOLL	440.36	482.787	0.912	0.3621
BS	-261.35	915.926	-0.285	0.7755
MS	3082.93	6151.802	0.501	0.6165
Job Title Variables				
ASSTHM	292.48	1068.661	0.274	0.7844
BARNMGR	315.23	1565.140	0.201	0.8405
CALFMGR	-2975.06	1467.677	-2.027	0.0431
CROPSMGR	8046.14	2208.509	3.643	0.0003
FEEDER	870.57	1227.169	0.709	0.4784
GENFARM	99.06	905.292	0.109	0.9129
HEIFERMGR	-600.23	2534.374	-0.237	0.8129
HERDMGR	1114.97	1450.730	0.769	0.4425
MACHOPR	1422.52	1305.496	1.090	0.2764
MECHANIC	3186.48	1402.154	2.273	0.0234
MILKINGMGR	494.66	1526.249	0.324	0.7460
Shift Variables				
NIGHT	-1019.43	732.152	-1.392	0.1644
SWING	-280.90	845.184	-0.332	0.7398
Key Responsibility Variables				
BREEDING	-1627.39	996.875	-1.632	0.1032
CALFMGMT	-140.58	870.444	-0.162	0.8718
CHEMICALS	-151.92	1440.663	-0.105	0.9161
CROPMGR	-122.27	1753.834	-0.070	0.9444
FEEDING	-681.82	642.907	-1.061	0.2894

Table 3.11 (Continued)

GENCROPWORK	-1832.87	783.951	-2.338	0.0198
GENHERDWORK	-885.73	594.948	-1.489	0.1371
HEATDET	-134.38	625.644	-0.215	0.8300
HEIFERMGMT	-234.12	833.160	-0.281	0.7788
HERDHEALTH	129.23	754.527	0.171	0.8641
HERDMGMT	1908.67	1064.784	1.793	0.0736
MACHREPAIR	471.62	817.666	0.577	0.5643
MAINTENANCE	482.46	580.988	0.830	0.4067
MANUREMGMET	-1521.69	722.272	-2.107	0.0356
MILKING	572.24	673.792	0.849	0.3961
OPRMACH	336.71	780.005	0.432	0.6661
RECORDS	1612.08	805.070	2.002	0.0457
SCHEDULING	841.53	1110.360	0.758	0.4488
SILOMGMT	361.06	940.848	0.384	0.7013
SOILMGMT	-1700.65	1628.097	-1.045	0.2967
TRAINING	-386.35	825.735	-0.468	0.6400
Experience Variables				
PRIOREXP	15.58	25.969	0.600	0.5487
PRIORFARM	210.62	62.898	3.349	0.0009
YRSPOSITION	290.86	54.834	5.304	0.0000
Competency Variables				
LEVEL2	2901.49	880.127	3.297	0.0010
LEVEL3	5571.56	993.398	5.609	0.0000
LEVEL4	8601.28	1239.867	6.937	0.0000
LEVEL5	11189.72	1955.332	5.723	0.0000
UNEMPLOYMENT	-16133.55	15270.730	-1.057	0.2912
SALARIED	433.09	604.190	0.717	0.4738

The model has an Adjusted R-Squared of .56 and an F-statistic of 16.016, fairly strong statistical results for cross-sectional data. Of the 54 variables, 15 are significant at the .95 level. It is perhaps as important to look at those variables that did not explain a statistically significant amount of the variation in Total Compensation as those that did in order to better understand the variables that do or do not influence compensation.

It is helpful to look at the variables as members of different categories: Farm Size, Employee Educational Background, Employee Job Title, Employee Shift, Employee Key Responsibilities, Employee Experience, Employee Competency, Employee Pay Format (hourly/salary), Local Area Unemployment Rate, and Hours Worked Per Week.

Farm Size: One of the interesting results from this analysis is the statistical significance of both size variables, COWS and ACRES. Even more interesting is the signs of these coefficients. While compensation values trended upward for larger herd

sizes, the opposite happened with regard to number of acres. So larger cow numbers result in a higher compensation rate for employees while the opposite is true when increasing acreage. This portrays a tendency to compensate cropsworkers at a lower rate than people employed in the dairy side of the business.

Key Responsibilities: Two of the three key responsibilities variables that were statistically significant were GENCROPWORK and MANUREMGMT, and both had negative signs, consistent with the size findings. The third significant responsibility, RECORDS, had a positive value, demonstrating the significant value employers put on employees who regularly keep records. As a reminder, none of the responsibility variables were included as base variables because they have no threat for autocorrelation.

Experience: A priori information indicated that it is typically unimportant for individuals to have prior dairy experience for many positions on these farms. The regression output supports that hypothesis as PRIOREXP has a very small coefficient which is not statistically significant, while the other experience variables are significant at the .05 level. For every year of experience on the farm, not in the current position, total annual compensation increases by $210. With a coefficient of 290, YRSPOSITION is even larger and more significant, denoting a natural seniority-based compensation principle. Therefore, with our compensation bands, the number of years a person has been in his or her current position is quite possibly a determinant of that individual's position within the wage band. As he or she develops even more seniority, it is highly likely that these employees may advance to a higher competency level, resulting in a higher compensation rate while maintaining the same job title.

Competency Level: In keeping with the theory behind the design of the competency levels and our previous compensation results, the competency levels are all statistically significant and follow much the same pattern presented through the pay bands. Where Level One is the base variable, the subsequent levels have greater and greater coefficients that increase by roughly $3000 each level. Therefore, the model shows that an increase in competency level alone, regardless of an increase in tenure or change in job title, results in an increase in the value of an employee's total compensation package of about $3000.

Unemployment: The regression output follows closely with economic theory in some respects. Although this coefficient is not statistically significant, the signs indicate that an increase in local area unemployment has a negative impact on the price of labor.

Education: The coefficients assigned to the education variables were not consistent with theory on this subject. While High School Degree was the base variable, SOMEHS had a positive sign, indicating that graduating from high school results in a lower compensation rate. BS had a negative sign. It is important to note, however, that none of the education variables were statistically significant.

While the descriptive statistics showed an increase in education with advanced competency levels, this econometric information demonstrates that the education variables themselves are not the determining factors in the compensation amounts that accompany those levels. The argument can be made, however, that individuals with

higher degrees of education are typically members of the higher competency levels, thus giving them more in total compensation. Further econometric analysis could be done to weight the seven education dummy variables into one continuous education variable where education could be measured in units of education rather than levels such as degrees. For the scope of this research, this was not really imperative but could be interesting for further study.

Shift: According to pre-test interviews, many employers pay a shift differential to employees working nights, a fact not seen in the econometric findings. The coefficients for shift were not statistically significant and exhibited signs contrary to the a priori information.

Remember that the dependent variable in this regression is Total Compensation and the shift differential typically comes through the hourly, or annual wage. It is possible that this amount gets "watered down" when looking at the value of an entire compensation package. To examine this further, another regression was performed using Annual Wage as the dependent variable (Table 3.12).

Table 3.12 Regression Analysis Results for the Annual Wage Model

Dependent Variable is ANNUALWAGE
Sample(adjusted): 1 - 708
Included observations: 592
Excluded observations: 116 after adjusting endpoints

R-squared	0.638374	F-statistic	18.69127
Adjusted R-squared	0.60422	Prob(F-statistic)	0

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	3080.22	1514.603	2.034	0.0425
HRSWEEK	340.95	20.641	16.518	0.0000
Size Variables				
ACRES	-1.48	0.350	-4.251	0.0000
COWS	2.51	0.441	5.699	0.0000
Education Variables				
SOMEHS	-397.47	496.999	-0.800	0.4242
AS	320.13	612.636	0.523	0.6015
SOMECOLL	339.84	352.004	0.965	0.3348
BS	-235.11	667.809	-0.352	0.7249
MS	4540.47	4485.325	1.012	0.3119
Job Title Variables				
ASSTHM	322.50	779.169	0.414	0.6791
BARNMGR	-923.77	1141.155	-0.810	0.4186
CALFMGR	-1550.90	1070.094	-1.449	0.1478
CROPSMGR	7283.76	1610.240	4.523	0.0000

Table 3.12 (Continued)

FEEDER	1166.54	894.738	1.304	0.1929
GENFARM	-210.97	660.055	-0.320	0.7494
HEIFERMGR	1765.94	1847.831	0.956	0.3397
HERDMGR	961.44	1057.738	0.909	0.3638
MACHOPR	2528.81	951.847	2.657	0.0081
MECHANIC	3573.52	1022.321	3.495	0.0005
MILKINGMGR	710.13	1112.799	0.638	0.5236
Shift Variables				
NIGHT	464.92	533.818	0.871	0.3842
SWING	-114.18	616.230	-0.185	0.8531
Key Responsibility Variables				
BREEDING	-1290.28	726.829	-1.775	0.0764
CALFMGMT	-191.42	634.647	-0.302	0.7631
CHEMICALS	-2413.11	1050.398	-2.297	0.0220
CROPMGR	-587.42	1278.733	-0.459	0.6461
FEEDING	-1610.25	468.748	-3.435	0.0006
GENCROPWORK	-375.30	571.585	-0.657	0.5117
GENHERDWORK	-399.26	433.781	-0.920	0.3578
HEATDET	-243.30	456.162	-0.533	0.5940
HEIFERMGMT	599.43	607.463	0.987	0.3242
HERDHEALTH	900.06	550.131	1.636	0.1024
HERDMGMT	631.57	776.342	0.814	0.4163
MACHREPAIR	956.70	596.166	1.605	0.1091
MAINTENANCE	294.99	423.603	0.696	0.4865
MANUREMGMET	-1028.90	526.614	-1.954	0.0512
MILKING	27.09	491.267	0.055	0.9560
OPRMACH	-682.91	568.707	-1.201	0.2303
RECORDS	1366.31	586.982	2.328	0.0203
SCHEDULING	88.59	809.572	0.109	0.9129
SILOMGMT	150.60	685.979	0.220	0.8263
SOILMGMT	142.63	1187.058	0.120	0.9044
TRAINING	-220.96	602.049	-0.367	0.7138
Experience Variables				
PRIOREXP	21.11	18.934	1.115	0.2653
PRIORFARM	226.28	45.860	4.934	0.0000
YRSPOSITION	172.74	39.980	4.321	0.0000
Competency Variables				
LEVEL2	1032.07	641.707	1.608	0.1083
LEVEL3	2864.04	724.294	3.954	0.0001
LEVEL4	4813.95	903.997	5.325	0.0000
LEVEL5	5170.68	1425.647	3.627	0.0003
UNEMPLOYMENT	-38726.86	11134.000	-3.478	0.0005

SALARIED	-2077.28	440.520	-4.716	0.0000

Using the R-Squared and F-Statistic as measurements of fit, this model is slightly stronger than the model of compensation. This regression has a slightly higher Adjusted R-Squared, .60, and F-Statistic, 18.69. While the shift variables were not statistically significant in this regression either, the signs kept with our methodology. This regression brought another variable into statistical significance. According to the data presented in Table 3.12, unemployment is now a determining factor in the value of annual cash wages. In keeping with economic theory, as the unemployment rate for an area increases, the annual wage level decreases. This tendency was expressed in the total compensation model, as well, but is statistically significant in this model. This demonstrates that wages are more closely tied to unemployment than are benefits and other factors that figure into an employee's total compensation package.

Also, whether an employee was paid on an hourly or salaried basis was statistically significant in the Annual Wage model, unlike the model of Total Compensation. In addition, the coefficients for the SALARIED variable had different signs in the two regressions, negative for ANNUALWAGE and positive for TOTALCOMP. So the econometrics indicate that when considering only cash wage, the salaried employees are receiving a significantly lower annual cash wage. In the total compensation model, they receive more than their hourly coworkers, but this has no statistical significance.

Another difference in the results of the two models is that the Competency Level Two employees' annual cash wage is not statistically different from the cash wage of a Level One employee. As a contrast, their total compensation amounts are statistically different. This supports the theory that higher level employees receive more and more of their compensation through non-wage elements. This is more noticeable between employees of levels one and two.

Compensation According to Farm Size

The econometric information indicates that, for employees, the more cows on the farm, the bigger the paycheck. As illustrated in the farm information portion of this section, larger farms do have more non-wage benefits and incentives, on average. This section presents the employee compensation information according to farm size, particularly the three subsets of farm sizes presented in the general farm information portion of this section. The annual total compensation and cash wage information, as well as the different percentages of employees in each group that receive some of the alternative compensation elements, are given in Table 3.13.

Table 3.13 Employee Compensation Elements According to Farm Size

	<299 Cows N=73	300-550 Cows N=209	>550 Cows N=424
Mean:			
Total Compensation[1]	$25,446	$26,000	$28,500
Annual Wage	20,882	22,490	23,560
Hourly Compensation	8.62	8.96	9.95
Hourly Wage	7.18	7.73	8.09
% of employees with:			
Health Insurance	50.68%	42.10%	56.60%
Retirement Plans[2]	12.32	27.75	29.24
Other Bonuses	27.39	33.01	67.68
Housing Benefits	30.13	27.75	29.48

[1] These means are not statistically different from each other at the .50 significance level.

[2] This only includes employees for which the employers contribute to the retirement plan.

Compensation values do, in fact, increase between the size subsets for larger and smaller farms. It is important to note, however, that the mean total compensation values for each group are not statistically different at even the .50 level of significance from the means of the other categories. So while the descriptive data shows an increase, on average, this increase is not statistically significant. The same is true for the annual wage and hourly statistics.

The largest difference is in the percentage of employees who receive incentives. Only 27 percent of employees on farms with fewer than 300 cows receive bonuses or other incentives, compared with 68 percent of employees on the larger farms. These incentives come in a variety of forms (Appendix A). Although this spread seems large, the means are not significantly different from each other.

Retirement Plans are in place for a greater percentage of employees on the larger farms on average, specifically those farms with herd sizes of 300 cows or more. On those farms, nearly 30 percent of all full-time, non-owner employees have this benefit, compared with only 12 percent of employees on the smaller farms. As a note,

some producers interviewed from farms of all sizes indicated that they were in the process of developing retirement programs at the time of the interview. Future study is likely to show an increase in these percentages for all farms.

Producers on farms of all sizes have seen the importance of health insurance to their employees (Section 4.5). Nearly half of the employees on all size subsets currently receive health insurance as a part of their compensation package. Another benefit that was fairly constant across the board was farm-provided housing, with about 30 percent of employees in all three size subsets receiving housing as a part of their compensation program.

Looking at this information by competency level provides more insight on the compensation of specific classes of employees. By cross-sectioning the compensation information by both farm size and competency level, interesting conclusions can be seen about pay and benefits on these farms (Table 3.14).

Table 3.14 Employee Compensation and Annual Pay According to Competency Level and Farm Size

Level/Cows	Total Compensation	Annual Wage	Compensation per Hour	Hour Wage Equivalent
Level 1				
<299	$ 20,650.00	$ 20,032.22	$ 7.75	$ 7.53
300-549	20,019.40	18,506.03	7.08	6.60
>550	22,538.13	20,129.98	7.88	6.94
Level 2				
<299	$ 22,822.44	$ 18,046.56	$ 7.97	$ 6.48
300-549	22,229.10	19,528.00	8.11	7.17
>550	25,278.27	21,050.36	9.09	7.53
Level 3				
<299	$ 24,356.44	$ 19,663.88	$ 8.54	$ 7.03
300-549	26,166.97	23,203.99	8.95	7.96
>550	29,696.84	24,364.65	10.41	8.50
Level 4				
<299	$ 29,660.21	$ 24,631.29	$ 9.67	$ 8.09
300-549	32,293.31	27,211.02	10.69	9.00
>550	37,201.98	29,825.87	12.29	9.83
Level 5				
<299	$ 32,237.33	$ 24,170.00	$ 8.98	$ 6.70
300-549	35,019.64	25,191.64	11.05	7.88
>550	47,532.07*	37,597.00*	14.97	11.86

* Statistically different from mean value of preceding size group within the same competency level at the .50 statistical significance level.

The spread between the total compensation values of the different sizes of farms widens from competency level to competency level. This demonstrates a tendency for employees in lower competency levels to be compensated at more similar rates, regardless of farm size. This is consistent with the pay bands illustrated for employees of all farms. It stands to reason that larger farms have more employees with higher level employees taking on more managerial roles. While the differences between the size subsets are fairly consistent within each competency level, Level Five shows a difference in annual wage and total compensation between the two larger farm size groups that is much larger than the spreads in the other levels. Even so, the mean compensation values for Level Five employees in the smallest and largest farm size subsets are only statistically different at the .50 level of significance.

SECTION FOUR:

EMPLOYEE SATISFACTION

Introduction

This research was made possible by a very valuable and rare opportunity. The farm members of the Northeast Dairy Producers Association were very generous with their employees' time. Given this unique opportunity employee satisfaction was a feasible objective of this study. Also relevant was determining exactly what is important to these employees and if the farm managers are truly in-tune with their employees' feelings. In addition, with employers placing more and more emphasis on non-cash compensation, questioning employees about the importance of certain types of benefits became an objective of the study. In this section, the employee responses to these issues are presented and analyzed.

Descriptive Information

As stated in the methodology, time and budget constraints, as well as the desire for a homogeneous sample set, dictated that this portion of the research focus on a subset of the NEDPA membership. In all, thirty farms were visited, resulting in 296 employee surveys. These were full-time, non-owner employees of farms with herds ranging from 500 to 1500 cows.

It is important to understand this is not the same group of producers included in the largest size subset of the previous section. The groups should be differentiated in two ways. First, this group includes operations with herds ranging from 500 to 1500 cows, therefore excluding the very large operations and those farms with fewer than 500 cows. The herd size information related in this section is based on information given by the producers during the personal interviews. The Employee Satisfaction subset was determined prior to the interviews, based on herd sizes given in NEDPA registration information.

These operations are managed by a very experienced group of producers. According to Table 4.1, these individuals have, on average, 28 years of dairy and 19 years of management experience. In addition, note how these operations compare with industry and NEDPA averages with respect to milk production and herd sizes.

Table 4.1 Demographic Information from Farms Participating in the Satisfaction Subset

Averages	Satisfaction Subset (500-1500 cows)	NEDPA Membership[1]	New York State Average[2]
Annual Output per Cow	23,555[3]	22,545[3]	16,519
Number of Cows	812	537	81
Dairy Experience[4]	28	26	---
Management Experience[4]	19	19	---

[1] Based on the sample of all farms visited in this study
[2] Based on new York Agricultural Statistics, 1997-1998
[3] 1997 Pounds of Milk Sold Per Cow
[4] Years of experience of manager interviewed

The employees in this sample have an average of 13 years of experience in the dairy industry and have been with their current employer for an average of five years (Table 4.2). The education information follows much the same pattern demonstrated in the larger internal pay sampling. The bulk of these employees have a high school education with 16 percent having less than a high school education and roughly 30 percent having some college exposure or degree. The employees in this sampling had a similar distribution throughout the competency levels.

Table 4.2 Demographic Employee Information for Satisfaction Subset

	Mean	Standard Deviation	Sample Size
Experience			
Years Experience	13.1	12.2	285
Years on Farm	5.1	6.24	292
Years in Current Position	3.4	4.7	291
Education			
Some High School	16%	.37	270
High School Degree	54%	.50	270
Some College	11%	.31	270
Associate's Degree	9%	.29	270
Bachelor's Degree	10%	.30	270
Master's Degree	0.37%	.06	270
Pay System			
Annual Salary	26%	.44	292
Hourly Wage	74%	.44	292
Shift			
Day	73%	.44	291
Night	17%	.38	291
Swing	10%	.30	291
Level			
Level 1	7.5%	.26	292
Level 2	41%	.52	292
Level 3	35.6%	.48	292
Level 4	15%	.36	292
Level 5	2.7%	.16	292
Hours Worked per Week	56	9.5	285

As before, considering the demographic criteria by competency level allows some understanding about the employees typified by this data. The information provided in Table 4.3 follows much the same pattern as the demographic data for the entire group of NEDPA employees by competency level depicted in Section Three. We still see an upward trend in tenure and education across the competency levels.

Table 4.3 Demographic Employee Information for Satisfaction Subset by Competency Level
N=292

	Level 1	Level 2	Level 3	Level 4	Level 5
Experience					
Years Experience	8.9[1]	10.6	15.5	15.7	16.3
	14.1[2]	11.7	13.1	9.2	7.6
	20[3]	115	102	44	7
Years on Farm	2.2	3.7	6.1	6.9	9.5
	4.7	4.7	6.72	7.9	6
	22	117	105	44	7
Years in Position	1.9	2.7	4.0	5.1	2.4
	4.6	3.4	5.2	6.0	1.4
	22	117	104	44	7
Education					
Some High School	35%	22%	14%	2%	---
	.49	.41	.35	.15	0
	20	100	102	44	7
High School Degree	55%	61%	55%	41%	29%
	.51	.49	.50	.50	.49
	20	100	102	44	7
Some College	---	11%	11%	11%	29%
	0	.31	.31	.32	.49
	20	100	102	44	7
Associate's Degree	5%	4%	11%	18%	14%
	.22	.19	.31	.39	.38
	20	100	102	44	7
Bachelor's Degree	---	2%	11%	25%	29%
	0	.14	.31	.43	.49
	20	100	102	44	7
Master's Degree	---	---	---	2%	---
	0	0	0	.15	0
	20	100	102	44	7
Pay System					
Annual Salary	14%	26%	25%	25%	43%
	.35	.44	.43	.44	.53
	22	116	105	44	7
Hourly Wage	86%	74%	84%	75%	57%
	.35	.44	.43	.45	.53
	22	116	104	44	7
Shift					

Table 4.3 (Continued)

Day	64%	63%	81%	82%	86%
	.49	.48	.40	.39	.38
	22	117	104	44	7
Night	23%	19%	17%	14%	14%
	.43	.39	.38	.35	.38
	22	117	104	44	7
Swing	14%	18%	2%	4%	---
	.35	.39	.17	.21	0
	22	117	104	44	7
Hours Worked per Week	58	54	60	58	62
	11.4	9.5	9.5	7.6	8.0
	22	114	101	41	7

[1] Mean
[2] Standard Deviation
[3] Number of Observations

Employee Satisfaction

Section Two outlines the survey instruments and theory used to quantify the satisfaction of the employees surveyed in this research. In the instruments used, satisfaction is measured on a scale of one to four, with one being very satisfied, two being somewhat satisfied, three being somewhat dissatisfied, and four being very unsatisfied. Based on the research results, employees on these farms have an overall satisfaction level of 1.79 (Table 4.4).

Table 4.4 Employee Satisfaction for All Employees by Competency Level[1]
N=292

Satisfaction	Employees					
	All	Level 1	Level 2	Level 3	Level 4	Level 5
Total	1.79	1.94	1.84	1.78	1.60	1.71
	.38[2]	.37	.39	.36	.33	.45
	292[3]	22	117	105	44	7
Variety	1.88	2.07	1.97	1.85	1.67	1.96
	.56	.56	.61	.51	.46	.62
	292	22	117	105	44	7
Task Identity	1.52	1.71	1.54	1.53	1.40	1.43
	.40	.47	.38	.39	.40	.43
	292	22	117	105	44	7
Autonomy	1.81	1.94	1.94	1.79	1.52	1.57
	.51	.47	.52	.49	.46	.37
	292	22	117	105	44	7
Feedback	1.92	2.02	1.90	1.95	1.82	1.86
	.61	.54	.58	.52	.45	.50
	292	22	117	105	44	7

[1] Where 1 is very satisfied and 4 is very unsatisfied
[2] Standard Deviation
[3] Number of Observations
*NOTE: The mean satisfaction values of no two levels are statistically different from each other at the .50 significance level.

Consider the four components of employee satisfaction. Employees are most satisfied with Task Identity. They can easily see the relevance of their work and how they play a role in the success or failure of the business. Task Identity responses were not only the most positive, at 1.52, but they also had the smallest standard deviation, indicating that this perception was consistent across the sample of employees surveyed.

Next, employees were, on average, satisfied with the Autonomy presented through their jobs. Autonomy, or a sense of ownership about one's work, resulted in a score of 1.81 on the four point scale. These scores had a 0.51 standard deviation.

The aspect of satisfaction that performed third in this survey was Variety, scoring 1.89 with a standard deviation of 0.55. Overall, employees ranked Feedback from superiors lowest of all. This scored 1.91 with a 0.61 standard deviation. While many factors, such as Variety, have certain challenges that are intrinsic in the job, Feedback is entirely in the hands of the owners or managers, yet it is the core dimension employees are least satisfied with. This is an important result for these producers because, according to these results, their employees crave Feedback more than any other satisfaction component, and it is the component over which the employers have the most control.

It is perhaps even more interesting to note the satisfaction trends that exist within the competency levels (Table 4.4). Satisfaction steadily increases from one competency level to the next until Level Five when the satisfaction decreases for each of the four core dimensions. As a result, Level Four employees are the most satisfied employee group. Keep in mind that the mean satisfaction values for each competency level were not statistically different from the values for any other competency level. So while the trend is apparent, it cannot be supported statistically.

Of the four core dimensions, Task Identity continues to be the strongest among employees of all competency levels. Autonomy is the second strongest for all groups, except Level Two employees who consider Feedback the second strongest dimension. This indicates that Level Two employees feel worse about the level of control they have over their job's key responsibilities than they feel about the amount and quality of Feedback they receive from supervisors. Perhaps Level Two employees are in positions where training and evaluation is an active part of their job.

Generally, the data reflects well on the satisfaction of these employees. While overall, Feedback is the area with the most room for improvement; employees in levels one, two, and five struggle more with Variety than any other dimension. This is not surprising, considering the nature of the competency groupings, for ones and twos, but it does not fit with the methodology for fives.

These results are the measurement of perceived Variety, not of actual differences in an employee's tasks. The perception an employee has of Variety is closely linked to the challenge associated with his or her work. It is possible individuals struggling with Variety are not dissatisfied with the number and type of different tasks, but rather they are not challenged by these tasks.

Remember, Level Five employees are individuals who have risen to the highest levels on the farm without gaining ownership. Also, one should note that the sample size for Level Five employees is very small relative to the samplings of the other competency levels when considering this statistical information. So while employees are, on average, satisfied with their jobs, there is room for improvement, particularly with Feedback and Variety. Again, note that the mean values are not statistically different from each other when considering values within the same core dimension and between means of different competency levels.

Employee and Employer Rankings

Employees were given a list of eight attributes that are frequently associated with work. They were then asked to rank those items in order of importance to them. Employers were presented with the same list and asked to predict their employees' responses. The items and the responses of both groups are outlined in Table 4.5.

Table 4.5 Employee and Employer Rankings*

	Employee Ranking	Employer Ranking	Employee Mode	Employer Mode
Good Working Conditions	1	2	1	2
Good Wages	2	1	1	1
Job Security	3	4	1	2
Opportunity for Advancement	4	7	4	6
Challenging Work	5	5	6	5
Increased Responsibility	6	6	6	7
Recognition for Achievement	7	3	7	3
Access to Information	8	8	8	8

*Where 1 is most important and 8 is least important.

For employees, Working Conditions, Good Wages, and Job Security form a clear break from the other items listed. Perhaps the most telling statistic is the mode of each option. The modes for Wages, Working Conditions, and Job Security were all one. Opportunity for Advancement was most frequently ranked fourth with Challenging Work and Increased Responsibility both receiving more scores of six than any other. Access to Information and Recognition for Achievement had modes of eight and seven, respectfully. These statistical measures further emphasize the natural breaks in the responses given by the employees interviewed in this study.

There was not statistical difference in the employer predictions and the actual employee rankings at the .05 significance level. While the employers missed the total employee ranking only slightly for six of the eight items, resulting in near perfect predictions, two items were different. According to these results, employers underestimate the importance of Opportunities for Advancement. Employees gave this an average value of 4.58, making it the fourth most important item evaluated. Employers, however, scored it at 5.90, leaving it seventh. Contrarily, the average employee ranked Recognition for Achievement seventh, while the employers considered it the third most important thing for their employees.

Employees of different levels can have different perspectives on these issues. Consider Table 4.6 which compares the rankings given by employees in each competency level. Factors such as Access to Information and Recognition for Achievement are consistently low and Wages and Working Conditions are consistently high. Challenging Work and Job Security varied from level to level. Some interesting things to note include: Good Wages is the most important item for Levels Three and Five; Job Security is lower for Level Fives than for any other level; Challenging Work is lower for Levels Two and Three than for any other level; Level Fives are the only group to include Increased Responsibility in the top five. Again, the differences here are not statistically different from each other at the .05 level of significance.

Table 4.6 Employee Rankings by Competency Level[1]

	Level 1	Level 2	Level 3	Level 4	Level 5
Good Working Conditions	1	2	2	1	3 (tie)
Good Wages	3	1	1	2	1
Job Security	4	3	3	5	7
Opportunity for Advancement	5	4	4	4	5
Challenging Work	2	5	5	3	2
Increased Responsibility	6	7	7	6	3 (tie)
Recognition for Achievement	7	6	6	8	8
Access to Information	8	8	8	7	6

[1] Where 1 is most important and 8 is least important

Benefit Importance

Because employers are utilizing more and more non-cash compensation methods, employees were asked how important certain benefits were to them. From the results outlined in Table 4.7, we can see that Paid Vacation, Health Insurance, and Retirement Plans were the most important benefits for these employees, on average. The average scores indicate these benefits were all at least somewhat important. Only housing had a mode of three, meaning that the most frequently occurring score was that of unimportant. Also, Housing had the lowest average score, 2.21.

Table 4.7 The Importance of Benefits for All Employees and by Competency Level [1]

	Employees					
	All	Level 1	Level 2	Level 3	Level 4	Level 5
Paid Vacation	1.29	1.33	1.31	1.32	1.16	1.14
	.53[2]	.48	.56	.55	.43	.38
	282[2]	21	117	105	44	7
Paid Sick Leave	1.64	1.63	1.55	1.69	1.80	1.86
	.68	.72	.61	.68	.73	.90
	292	22	117	105	44	7
Bonuses	1.56	1.68	1.44	1.59	1.70	1.67
	.62	.57	.58	.62	.70	.52
	289	22	117	103	44	6
Profit Sharing	1.75	1.65	1.78	1.84	1.57	1.85
	.73	.67	.71	.76	.62	1.21
	288	20	117	103	44	7
Housing	2.21	2.00	2.17	2.26	2.36	2.14
	.84	.89	.86	.84	.78	.69
	291	21	117	105	44	7
Ag Products	2.11	1.90	2.21	2.03	2.28	1.57
	1.35	.62	1.93	.77	.73	.53
	287	21	113	105	43	7
Health Insurance	1.33	1.29	1.30	1.24	1.18	1.29
	.63	.72	.58	.53	.50	.38
	289	21	116	105	44	7
Retirement Plan	1.39	1.41	1.42	1.38	1.35	1.14
	.63	.67	.65	.63	.57	.37
	289	22	116	104	43	7

[1] Where 1 is very important and 4 is very unimportant
[2] Standard Deviation
[3] Number of Observations

The averages for each competency level were consistent with the overall findings with one exception. For Level Four employees, Profit Sharing had a score of 1.56, making it the third most important benefit listed. For the other levels, Profit Sharing ranked fifth or sixth.

Another surprise was the importance Level Five employees placed on Agricultural Products, scoring it 1.57, by far the highest priority of any group for this benefit. In fact, Agricultural Products resulted in the fourth most important benefit for members of this grouping.

Health Insurance was consistently high, but it was a lower priority for levels four and five than for lower level employees. Paid Sick Leave seems to become less important with each level, while Retirement Plans do the opposite. Higher level employees value Retirement more than members of lower levels, although the importance is high for all.

SECTION FIVE:

LINKS BETWEEN PAY AND SATISFACTION

Introduction

Data on compensation and satisfaction allows this section to draw some conclusions about the age-old question, "Does money make employees happy?" This research also examines other employee and job characteristics and determines their correlation with satisfaction. Of course, causality is beyond the scope of this data. Correlations, however, are a viable tool for this research. In this section, correlations between the total satisfaction variables and compensatory factors for employees in the employee satisfaction subset are presented. Furthermore, significance tests are used to determine if there are any correlations between satisfaction and employee demographic or job characteristics. It is important to emphasize that this information represents the same population subset used in Section Four, herds of 500 to 1500 cows.

Compensation/Satisfaction Correlations

Total compensation has a statistically significant positive correlation with Total Satisfaction and each core dimension except Feedback Satisfaction (Table 5.1). This makes sense as Feedback is the core dimension least related to job attributes and most related to interpersonal relationships. Remember from Section Four that Feedback is the lowest satisfaction area for the entire sample of employees and, according to this data, it is the only satisfaction dimension that is not positively correlated at significance level .05 with compensation. Total compensation by competency level has little significant correlation with satisfaction. The exception is the correlation between total compensation and Variety Satisfaction for Level Three employees.

Table 5.1 Correlations Between Satisfaction and Total Compensation for All Employees and Competency Levels

	Total Satisfaction	Variety Satisfaction	Task Identity Satisfaction	Autonomy Satisfaction	Feedback Satisfaction
All Employees N=292	.1656*	.1546*	.1509*	.2036*	.0037
Level 1 N=22	-.3183	.0361	-.4249	-.1906	-.3797
Level 2 N=117	.0474	-.1235	.1880	.1368	.0104
Level 3 N=105	.1647	.2494*	.1262	.1122	.0040
Level 4 N=44	.0468	-.1092	.0539	.1732	.0231
Level 5 N=7	.6517	.6936	.4130	.5468	.7389

* Denotes statistical significance at .05 level

Compensation is composed of cash wage, housing value, insurance value, retirement benefits, and any other cash bonuses or incentives. It is hypothesized that employees who receive these incentives would be more satisfied with their jobs or might feel more empowered, therefore having a higher Autonomy Satisfaction. Also, bonuses are frequently tied to performance, making it logical that employees receiving more bonuses or incentives might have higher Feedback Satisfaction. Breaking Total Compensation into its different elements provides further information (Table 5.2).

Table 5.2 Correlations Between Satisfaction and Compensation Elements

Employees	Satisfaction				
Element	Total	Variety	Task Identity	Autonomy	Feedback
All					
Annual Wage	.1864*	.2212*	.1322	.2106*	.0017
Hourly Wage[2]	.1939*	.1948*	.1327	.2259*	.0331
House[1]	-.0265	-.0446	.0438	-.0696	.0039

Table 5.2 (Continued)

Insurance[1]	-.0711	-.1386	.0388	-.0107	.0680
Retirement	-.0147	.0785	-.0016	.0127	-.1323
Other Benefits	.0353	-.0299	.0793	.0395	.0315
Level 1					
Annual Wage	-.3189	-.0354	-.4746	-.2215	-.2390
Hourly Wage[2]	-.1332	-.1106	-.0329	-.0952	-.1413
House[1]	.5601*	.4281	.3370	.4493	.4191
Insurance[1]	-.2648	-.2309	.2431	-.2449	-.4861
Retirement	-.8987*	-.8697*	-.9982*	-.8213*	-.7552*
Other Benefits	.0711	.4381	.7517*	.8433*	.2714
Level 2					
Annual Wage	.1482	.0609	.1938	.1881	.0347
Hourly Wage[2]	.0817	.0940	.2634*	.2571*	-.0808
House[1]	-.1219	-.1896	.0260	-.1405	-.0167
Insurance[1]	-.0836	-.2194	.0194	-.0053	.0001
Retirement	-.5457*	-.5420*	-.3284*	-.4275*	-.3862*
Other Benefits	-.2022	-.2482*	-.0445	-.1315	-.1305
Level 3					
Annual Wage	.2399*	.3160*	.1992	.1347	.0680
Hourly Wage[2]	.0587	.2457	.0047	.1035	.0163
House[1]	-.0583	-.0181	-.0197	-.0707	-.0596
Insurance[1]	-.2686*	-.2652*	-.1043	-.1976	-.2079
Retirement	.0305	.2096	.0128	.0475	-.1533
Other Benefits	.0536	.2425*	-.1106	.0459	-.0535
Level 4					
Annual Wage	.0931	.1756	-.0192	.0485	.0645
Hourly Wage[2]	.1317	.2749	-.0644	.0827	.0896
House[1]	-.2290	-.1063	-.0844	-.2304	-.2564

Table 5.2 (Continued)

Insurance[1]	-.0462	.0577	-.0039	.0119	-.2048
Retirement	-.1156	.0429	-.0628	-.0647	-.2310
Other Benefits	.0593	-.1036	.0681	.1876	.0260
Level 5					
Annual Wage	.3011	.5039	.1412	.0592	.3011
Hourly Wage[2]	.3428	.5869	-.0883	.3261	.2481
House[1]	.6275	.5083	.4435	.6737	.7604
Insurance[1]	.4456	.3150	.5153	.5545	.3682
Retirement	.6944	.4537	.5922	.8391*	.8187
Other Benefits	.9072*	.7222	.8746*	.9834*	.9080

[1] Indicates the presence or absence of a benefit rather than the value of the benefit
[2] Wage rate per hour for employees on an hourly pay system. It does not include an hourly equivalent for employees paid an annual salary.
* Denotes Statistical Significance at the .05 level

The results for all employees show a statistically significant positive correlation between Total Satisfaction and both Hourly and Annual Wage. The correlations between Total Satisfaction and the other compensation elements are not statistically significant, however. This difference is consistent with employer comments that their employees do not realize the value of the other compensation elements. These results support the argument that employees realize the value of cash wages more than the intrinsic value of benefits or perks, and therefore, annual cash wage has a greater influence on an employee's satisfaction.

As with total compensation, there are few statistically significant correlations for competency levels with the exception of Level Three where the correlation between Annual Wage and Total Satisfaction was statistically significant. Level Two employees correlated Hourly Wage with Task Identity and Autonomy Satisfactions.

Receiving Retirement Benefits correlated negatively and significantly with all satisfaction components for employees in Levels One and Two. There are no obvious theoretical explanations for this from either interviews or a priori information.

The correlations between the compensation elements and satisfaction by competency level offer some interesting observations (Table 5.2). For Level One employees, having a house results in a significant positive correlation with Total Satisfaction. Likewise, there is a significant positive correlation between Autonomy and Task Identity Satisfaction and the annual cash value of other benefits or perks. Interestingly, some other compensation elements had significant negative correlations with satisfaction. For example, Level Three employees displayed a negative correlation between total satisfaction and having insurance.

As noted in Section Three, higher competency levels receive more and more of their compensation through benefits. Consider that Level Five employees have a very positive correlation between other benefits and perks and Total Satisfaction, as well as satisfaction in Task Identity and Autonomy.

Demographic Correlations

Certain employee and job characteristics may influence an employee's satisfaction level (Table 5.3). Total Satisfaction was significantly correlated for all three tenure variables. This is consistent with the hypothesis that more experience results in an individual having more influence over his or her work. Lack of significance with Task Identity indicates employees are not gaining an understanding of their roles in the business through tenure alone. These results are also consistent with Feedback, as the correlations for Feedback here are very small and not significant. This further emphasizes the fact that Feedback Satisfaction is mainly influenced by communication with the employee's manager.

Table 5.3 Correlations Between Experience and Satisfaction
for All Employees
N=292

	Years Experience	Years With Farm	Years in Current Position
Total Satisfaction	.1358*	.1593*	.1348*
Variety	.1139	.1733*	.1174
Task Identity	.0349	.0910	.0569
Autonomy	.1453*	.1975*	.1577*
Feedback	.0908	.0659	.0602

* Denotes statistical significance at level .05

Another demographic variable that has a significant correlation with employee satisfaction is the number of hours an employee works per week. As seen in Table 5.4, there is a positive correlation between Total and Variety Satisfactions and hours worked per week for the entire sample of employees. This relationship is not significantly different from zero for the competency levels.

Table 5.4 Correlations Between Demographic Variables and Satisfaction for All Employees and by Levels
N=292

Employees	Satisfaction				
Variable	Total	Variety	Task Identity	Autonomy	Feedback
All					
Hours/Week	.1449*	.2216*	.0338	.1203	.0363
Career[1]	.2106*	.2371*	.1650*	.1599*	.0675
Day Shift	.0731	.1002	-.0179	.1687*	.0379
Night Shift	.0144	-.0117	.0244	-.0229	.0495
Swing Shift	-.1348	-.1306	-.0179	-.2418	-.0031
Level 1					
Hours/Week	.1399	.3323	-.4099	.0898	.3169
Career[1]	.0415	-.2173	.1135	.0673	.1805
Day Shift	-.0265	.2090	-.3907	-.0094	.05645
Night Shift	.2750	.2671	.1837	.2879	.0741
Swing Shift	-.2986	-.6192*	.3233	-.3384	-.1695
Level 2					
Hours/Week	.1039	.2083	-.0323	.0509	.0318
Career[1]	.1713	.2964*	.0422	.0822	.0437
Day Shift	.0424	-.0089	.0191	.2001	-.0692
Night Shift	-.0432	.0050	-.0605	-.1304	.0359
Swing Shift	-.0093	.0061	.0377	-.1193	.0503
Level 3					
Hours/Week	.1541	.1834	.1609	.1206	.0034
Career[1]	.2384*	.2019	.2097	.2108	.0911
Day Shift	.0883	.1820	.0549	.0735	.0333
Night Shift	-.0236	-.1242	.0858	.0099	-.0164
Swing Shift	-.2014	-.1366	-.1339	-.3081*	-.0202
Level 4					
Hours/Week	.2533	.3042	.1210	.0183	.3390
Career[1]	.3173	.2698	.3943*	.1269	.1611
Day Shift	.2043	.1473	.1611	.2082	.0935
Night Shift	-.0183	-.0331	-.0646	.0148	.0235
Swing Shift	-.3481	-.2182	-.1918	-.4100	-.2123
Level 5					
Hours/Week	-.0661	-.3083	.2312	-.0259	-.0345
Career[1]	.2106*	.2371*	.1651*	.1599*	.0675
Day Shift	.0436	.0254	.0739	-.0842	.1267
Night Shift	-.0436	-.0254	-.0739	.0842	-.1267
Swing Shift	---	---	---	---	---

[1]The employee indicated that he or she sees the dairy industry as a career
* Indicates statistical significance at .05 level

Eighty-three percent of the employees interviewed stated they perceived dairy employment as a career. As might be expected, viewing the job as a career has a positive correlation with Total Satisfaction and every core dimension satisfaction figure except Feedback. Working a swing shift is negatively correlated with Autonomy Satisfaction. Conversely, working a day shift is positively correlated with Autonomy Satisfaction. This comments as to the degree of ownership people who work varying shifts feel about their responsibilities. Also, swing shifts are typically reserved for lower level employees, frequently milkers. These people may not have a great deal of room for individualization of their jobs.

It is perhaps most interesting to note the factors that did not have a statistically significant correlation with satisfaction. These factors include herd size, number of acres, the farm's herd production average, whether or not an employee grew up on a farm, the area's unemployment rate, race factors, gender, and marital status.

Job Title Correlations

The most significant result of this section is that the job title of Milker has a negative correlation with Total Satisfaction, Variety Satisfaction, and Autonomy Satisfaction at the .01 significance level. This is the only job title that is statistically significant with Total Satisfaction. As Table 5.5 indicates, many job titles correlate with various core dimensions. For example, the job titles of Herd Manager and Feeder positively correlate with Autonomy Satisfaction, while the title of Machinery Operator has a negative correlation with Autonomy Satisfaction. General Farm Workers correlate negatively with Task Identity, as well in the sample of all employees. Again, Feeders have a positive correlation with Task Identity.

Table 5.5 Correlations Between Satisfaction and Job Title
for All Employees
N=292

	Total Satisfaction	Variety Satisfaction	Task Identity Satisfaction	Feedback Satisfaction	Autonomy Satisfaction
Milker	-.2034**	-.3139**	.0197	-.0867	-.1774**
Feeder	.0766	-.0886	.1491*	.0318	.1697*
Mechanic	.1123	.1729**	.0409	.0418	.0653
Machinery Operator	-.0731	.0612	-.1267	.0030	-.1889**
General Farm Worker	-.0753	.0612	-.1267	-.0072	-.1214
Herd Manager	.1216	.0701	.0499	.0592	.1767**

* Denotes Statistical Significance at the .05 level
** Denotes Statistical Significance at the .01 level

SECTION SIX:

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This section has three basic functions. To summarize the results from this comprehensive study of the NEDPA population, the general conclusions from each of the data analysis sections are reported first, providing both the quantitative information and the theoretical background surrounding each conclusion. Second, because of the many personal interviews conducted throughout this research, there are many qualitative observations pertaining to this population of dairy producers and their employees that support the analytical results. These observations are reported within this section. Finally, realizing that this, like most studies, is not all encompassing and more research in this area would be beneficial, this section outlines some future research possibilities.

Internal Pay Conclusions

The average total compensation for all employees in this study is $27,433 (Table 6.1). This level of compensation is especially interesting when considering the large average number of hours this group of employees works. This translates into an average hourly compensation rate of $9.51. Total Compensation includes the employee's annual wage, the employer's contribution to health insurance, retirement plan, and housing, plus any other benefits or perks the employee receives from the employer.

Table 6.1 Internal Pay Summary

	Mean	Standard Deviation	Number of employees
Total Compensation for All	$27,433	$8,100	709
Hours per Week for All	56	9.64	708
Hourly Comp. for All	$9.51	$2.45	709
Total Compensation for Level 1	$21,712	$4,414	72
Total Compensation for Level 2	24,315	5,662	255
Total Compensation for Level 3	28,123	7,553	238
Total Compensation for Level 4	34,083	8,019	116
Total Compensation for Level 5	38,847	9,664	24

The compensation information is much more revealing when the employee data is cross-sectioned by competency level. The trends seen in Table 6.1 demonstrate a natural hierarchy in these farming operations to compensate employees with more supervisory authority, capacity to make decisions, and skill at higher rates. The wage bands, illustrated in Figure 3.1, show the mean compensation values for each

competency grouping, as well as one standard deviation above and below the mean, forming wage bands that contain 68 percent of the compensation amounts derived from these surveys. Both the mean values and their standard deviations, or depth of the bands, increase with competency level. This indicates that although employees of higher competencies tend to receive more in total compensation, the compensation amounts within the bands vary more from level to level.

The data also indicates that employees within higher competency levels receive proportionately less total compensation through cash wages, indicating a trend to compensate higher level employees with benefits, including retirement benefits and health insurance. An interesting result was the increase in housing as a percentage of total compensation for Level Five Employees, 9.58 percent, as compared to Level Four Employees, 5.26 percent (Table 3.10). This could be explained by the fact that employees at that level are the most valuable to the farm, and if they are utilizing farm-provided housing, it is usually higher quality, and therefore more valuable. Also, some producers indicated in the interviews that although the farm gives these employees housing compensation, it is more in the way of home payments than of rent allowances for farm-owned properties.

While responses varied from farm to farm, there was a tendency to utilize multifaceted compensation packages that include any or all of the compensation elements listed above. This trend was more evident with larger operations. The three size subsets indicate slightly larger Total Compensation averages for the larger farms, although the averages are not statistically different, even at the .50 significance level. Another trend was that more of the various compensation elements were offered and utilized at larger farms.

The econometric analyses indicated that education does not have a statistically significant impact on the value of an employee's Total Compensation or Annual Cash Wage. On the other hand, the competency level variables were all significant. The two farm size variables, number of cows and number of acres, were both significant. But, interestingly, they had opposite signs. The Least Squares Regression output shows the number of cows has a positive relationship with both Total Compensation and Annual Cash Wage, while the opposite is true for acreage. This indicates that farm managers compensate employees on the cattle side of the business higher than their counterparts in field operations.

Prior dairy experience is not a statistically significant determinant of compensation, unlike the other tenure variables, such as years with the farm, and years in the current position, which were statistically significant. This result supports a priori information, which stated that employers value on-farm experience more than experience with other dairy operations.

Internal Pay Observations

During the employer interviews, many producers expressed a tendency to utilize somewhat nontraditional compensation methods that ranged from farm-provided vehicles with furnished gasoline to grocery credit at a local store (Appendix A). Many

employers seemed pleased with these non-wage compensation elements, stating that the compensation methods were beneficial for both the employer and the employee because of convenience and tax benefits. Other producers, however, conveyed concerns that good employees who did not realize the total value of their compensation package had left the farm for what seemed to be better financial opportunities.

There is no such thing as a one-size-fits-all compensation formula. This research is evidence that even within a very homogeneous business group, such as dairy operations, there is a lot of room for flexibility and individuality. One thing that remains consistently important is the flow of information to the employees about the values of their benefit packages. Judging from the interviews with the employers, many managers are not completely aware of the dollar values of their employees' total compensation packages. In fact, one of the most positive things about this study is that employers were forced to think about these values. Frequently, employers mentioned that they intend to keep track of these things, but other management challenges force employers to push analyzing their employees' total compensation packages lower and lower on the priority list.

The farm managers who did have up-to-date information on their pay structure with detailed values for traditional and non-traditional compensation elements stated that they provide that information to their employees on a regular basis. This seems to be a very effective and useful practice for both the employers and employees. The employers benefit from knowing what their compensation investments are. The employees benefit from the knowledge that they are not just receiving an hourly wage, but rather a total compensation package that may be competitive with other area employment opportunities.

Satisfaction Conclusions

The average Total Satisfaction for all employees interviewed was 1.79 on a scale from one to four where one is very satisfied, two is somewhat satisfied, three is somewhat unsatisfied, and four is very unsatisfied. The satisfaction statistics are perhaps more useful to producers when broken into individual scores for each core dimension: Variety, Autonomy, Feedback, and Task Identity. Interestingly, for the entire group of employees, Feedback is the core dimension where they are least satisfied. This is an important finding because considering the definitions of each core dimension and the intrinsic nature of this type of work in many instances, Feedback is the dimension that the employers and managers have the most control over, and yet it is the area in which their employees are least satisfied. Task Identity has the best scores of any of the satisfaction components, indicating that the employees are most satisfied with their ability to see the importance of their work to the entire business.

As with the compensation information, competency groupings allow similar sets of employees to be grouped together and the satisfaction information for each group analyzed. The data suggests that employees become more satisfied from lower to higher levels until Level Five when Total Satisfaction, as well as the satisfaction for each dimension, decreases. Keep in mind, no levels have means that are statistically different

from each other at even the .50 significance level for Total Satisfaction or for any core dimension. Recall, however, that this survey represents ninety percent of the full-time non-owner employees on these farms.

When considering satisfaction by competency level, it is evident that scores for Task Identity are high across the competency levels. In fact, Task Identity is the core dimension for which employees of every competency grouping are most satisfied. There is not a consensus for which area needs the most improvement; however, employees in levels one, two and five struggle most with Variety. This is interesting when considering the types of employees included in those groups, particularly level fives. One might expect the members of the lower levels to have little variety in their jobs, but certainly, the competency Level Five employees could meet many new and interesting challenges in a day. But variety is not just a function of difference but is also a function of challenge, and the perception of variety is what is important to evaluate.

Employees in levels three and four crave Feedback, as it is the dimension in which they are least satisfied. As indicated in Table 4.3, these employees typically have more tenure than members of the lower levels and have been performing their jobs for a number of years. It is human nature to assist newer employees and follow-up with them about their job performance, as they are new and unaccustomed to a particular business's way of doing things. This is probably not true for employees who have been with the farm for a number of years and have risen to competency level three and four status. This does not mean they crave the feedback and employer communication any less. Another reason Feedback is the poorest satisfaction variable for this group is that these employees are so well satisfied with the other core dimensions. With regular communication, employers can keep these important individuals who have the potential to be very satisfied in all areas.

Of the items employees were asked to rank, Good Working Conditions, Wages, and Job Security were the most important. The employers were very close to predicting these, as they had Good Wages, Good Working Conditions, and Recognition for Achievement in their top three. The employees said that the most important benefits to them are Paid Vacation, Health Insurance, and Retirement Plans.

Satisfaction Observations

The most interesting observation from the satisfaction portion of the study was the multiple interpretations of Good Working Conditions from the ranking portion of the survey. During conversations with the employees, they were asked their definition of working conditions. Frequently, that met with responses such as: This is a nice place to work; I like coming to work; People here are friendly; I can talk to my boss. This was not the intended definition when the survey instrument was established. Ranking Working Conditions was meant to capture more physical than emotional elements, such as: I feel safe here. There is adequate lighting and facilities are in good repair. Also, note that employees rated this first while employers rated it second

When the items included in the ranking portion were examined, it seemed no company culture elements had been included. In fact, Good Working Conditions was

the only option that could have possibly incorporated those elements of the job. The possibility then exists that the employees then translated Good Working Conditions as Good Company Culture and/or incorporated interpersonal relationships.

In hindsight, both culture and physical elements should have been included in the ranking portion of the survey. Also, the rankings did not include flexibility in scheduling. Many employers and employees stated during their respective interviews that weekend and holiday shifts put a great stress on employer/employee relations. Even with overtime pay on many of these occasions, it is very difficult to find people who are willing, much less happy, to be away from their families at these times. Agricultural businesses, especially dairy farms, must combat this natural, biologically controlled, disadvantage.

According to the employers interviewed, twenty-five percent of these operations pay an overtime rate for time worked above a set number of hours per week, not just on holidays. The hours per week necessary for overtime and the overtime rate itself was very different with different farms. Frequently, employers offered that when they do not pay an overtime rate and employees work especially hard for a period of time (i.e. harvest or planting), those employees may receive a special bonus. Other employers talked about the favorable experiences they have had with overtime pay—saying that it has been a good motivator of employees and eliminates many scheduling concerns.

Overall, employees seemed to enjoy being interviewed. While this is not without exception, many employees, especially lower competency level and those people working night shifts, were especially willing to talk about their jobs. This is especially important since the satisfaction information indicated that employees are least satisfied with the amount and quality of feedback they receive from their employers. While employers feel they are providing frequent and useful feedback, the employees certainly do not perceive they are receiving adequate feedback. During the employer interviews, managers were asked to describe any special things they do for their employees to reward good performance. The primary response was verbal communication. One easy method of providing feedback is for employers to make information such as yield percentages and somatic cell count readily available for employees. Also, regularly scheduled performance appraisal meetings remind employers and employees to communicate. Further research may quantify the prevalence of regularly scheduled performance appraisal meetings.

Correlation Conclusions

The correlations between each satisfaction component and the various compensation elements provide some interesting conclusions. The most interesting is that Feedback is the only satisfaction component not statistically correlated with total compensation for all employees. This reiterates the conclusion that Feedback is dependent upon communication from the employer or manager. This conclusion is consistent across the compensation spectrum. For Total Satisfaction and every other satisfaction dimension, total compensation is positively correlated. Of course, this does

not reflect causality, but it does indicate that more highly compensated people are typically more satisfied. These statistics are significant at the .05 level.

Another statistically significant correlation is Total Satisfaction and every tenure variable, indicating that individuals who have more prior experience, years with the farms, and years in his or her current position tend to be more satisfied. Having the job title of Milker resulted in statistically significant negative correlations with Total Satisfaction, Variety Satisfaction, and Autonomy Satisfaction.

Recommendations for Further Study

While this research determined that compensation increases with farm size and that larger farms utilize more compensation elements, it did not provide information on the satisfaction of employees at the smaller farms, so a comparison of employee satisfaction across the spectrum of farm sizes was not possible. Although there is a positive correlation between an employee's compensation and satisfaction, causality can not be determined. Further study of this matter is definitely necessary. The data collected through this research would serve as an excellent starting point for a time series study of compensation, as well as a base for more cross sectional satisfaction information should the NEDPA membership decide to expand this work by conducting employee satisfaction interviews on all farms, not just the subset utilized in this study.

Future research in this area could further capitalize on the advanced and proven econometric principles available to researchers. Certainly, the point factor compensation theory and the user-friendly econometric software packages that are currently available could take this and future data and expand it into a model that explains even more of the variation in compensation. This could be accomplished by compiling the dummy variables into continuous variables which would allow for more degrees of freedom and would not limit responses to yes or no, allowing data to fall into the "gray" areas that exist when relying upon dummy variables.

The producer members of the Northeast Dairy Producers Association should be commended for their devotion to the advancement of Human Resource Management in their businesses. While this research provides superb descriptive statistics and benchmark information on both compensation and employee motivation, additional research would be beneficial in studying satisfaction and compensation over time, as well as in expanding the satisfaction information to include all employees. Certainly, part-time employees play a vital role on many of these farms. Further studies may be well served to include these employees, as well as family or owner members as many of these farms rely heavily on employees from each of these groups. It is possible that excluding employees from each of these categories may present an unrealistic picture of the number and types of employees involved in these operations.

Feedback conclusions seen here indicate the need for further research in the areas of business and interpersonal communication on these farms. This research could elaborate on the findings of this study and help these producers in developing better communication mechanisms in their businesses.

APPENDIX A

Non-Cash Compensation Alternatives

Farm-Provided Vehicle
Farm-Provided Gasoline
Housing Utilities (heat/water/gas)
Basic Telephone Service Fee
Credit at Local Grocery Store
Trash Removal Service
Laundry Service
Uniforms
Subsidize Child Care

Bonuses and Incentive Programs

Farm Equity or Ownership
Milk Quality Bonus
Heat Detection Bonus
Punctuality Bonus
Farm Safety Bonus
Bonus for Not Smoking
Bonus for Referring a Potential Employee
Stress Bonus for unusual conditions (bad weather, harvest, etc.)
Calf Death-Loss Bonus
Artificial Insemination Settling Bonus

Special Things to Improve Morale and Reward Performance

Farm Picnics
Holiday Parties
Parties After Periods of Extreme Conditions
Long Weekends after Commendable Performance
Birthday Cards
Farm Softball Team
Profit Sharing
Team T-Shirts
Dinner to Celebrate the accomplishment of Monthly Goals
Awards for Most Improved Employee
Recognition for Tenure Anniversaries
Snacks or Refreshments
Employee Facilities (break-room, basketball court, etc.)

APPENDIX B:

Recruitment Methods Used By the Managers
Within the Last Three Years
N=92

Method	Frequency	St. Deviation
Referrals from other employees	1.67	.72
Word of Mouth	1.65	.64
Government Agencies	1.92	.82
Advertisements in Papers	2.59	.68
Colleges and Universities	2.16	.73
Private Employment Firms	2.90	.45

*Where 1 is Frequently, 2 is Sometimes and 3 is Never.

APPENDIX C:

Employee Satisfaction Survey

This survey is being conducted by Dr. Bob Milligan and Ms. Sarah Fogleman from Cornell University, in conjunction with the Northeast Dairy Producers Association. Your responses will be **STRICTLY CONFIDENTIAL**.

Please answer the following questions. When you are finished, place the survey in the envelope, seal the envelope, and return the sealed envelope to _____ who will then return the sealed envelope to us.

If you have questions or comments, please call Sarah Fogleman at (607) 255-1659 or Bob Milligan (607) 255-4579. Thank you for your participation.

Please **rank** the following items 1 through 8 in order of importance to you (where 1 is most important and 8 is least important.) You should use each number once.

_____ Challenging work
_____ Recognition for Achievement
_____ Access to Information
_____ Job security
_____ Good Wages
_____ Increased Responsibility
_____ Good working conditions
_____ Opportunity for Advancement

How important is it to you that your employer offers: (please check the box)

	Very Important	Somewhat Important	Not Important
Example: Dance Lessons			
Health Insurance			
Retirement Plan			
Paid Sick Leave			
Bonuses			
Profit Sharing			
Housing			
Agricultural Products			

Please **rate** the following statements: (please check the box)

1 Strongly Agree
2 Agree
3 Disagree
4 Strongly Disagree

example: Sometimes there is a lot of snow in January.	1	2	3	4
My job has variety.				
I can see the beginning, middle, and end of my tasks.				
I plan my own work.				
There are opportunities for recognition in my job.				
My job challenges me.				
My work contributes to the success of the business.				
I decide how my work should be done.				
My superior tells me how I am doing.				
I use many different skills in my job.				
My work is an important part of the whole farm.				
I feel personally responsible for my work.				
My supervisor makes helpful suggestions.				
My job is not repetitive.				
The things I do for my job are significant.				
I have opportunities to implement my own ideas in my work.				
I have access to information on key performance measures related to my job.				
My job offers opportunities to increase my skills or knowledge.				

We would like to know more about you. All information will be **STRICTLY CONFIDENTIAL.**

What is your age? _____

What would you say best describes your racial background: (check one)

Hispanic African American Caucasian
Native American Asian American

What is your sex? (check one) Male Female

What is your marital status? (check one)

Single Married Divorced

Do you see the dairy industry as a career? (check one) Yes No

Did you grow up on a dairy farm? (check one) Yes No

APPENDIX D:

General Farm Information Survey

Farm Name _____ Person Interviewed_____

Interviewee's Title_____ Years in Position _____

Years Mgmt. Experience _____ Years Dairy Experience _____

Farm Size (total # cows) _____Tillable Acres (owned & rented)_____

Herd Average (milk production) _____1997 Milk Sold/Cow _____

Farm County _____

Do you routinely provide meat to your employees? yes no

Do you routinely provide milk to your employees? yes no

Do you pay overtime? yes no after how many hours? _____

What is the overtime rate? _____

Do you provide paid vacation time to your employees? yes no How much annually:

Do you provide paid sick leave for your employees? yes no How much annually:

Do you provide health insurance? yes no

Do you provide a retirement plan?

no	Employee Contribution	Joint Contribution	Employer Contribution

Please describe your formal incentive program:

What special things do you do for your employees to reward performance?

What special things do you do for employees to improve morale (birthday cakes, sympathy cards, Christmas parties, year-end bonus)?

Please rank the following items according to how important you believe these factors are to your employees (where 1 is the most important and 8 is the least important.)

_____ Good Wages
_____ Recognition for Achievement
_____ Good working conditions
_____ Increased Responsibility
_____ Challenging work
_____ Opportunity for Advancement
_____ Access to Information
_____ Job security

In the past three years have you used this recruitment method

	Frequently	Sometimes	Never
Referrals from employees	1	2	3
Word of Mouth	1	2	3
Advertisements in local newspapers	1	2	3
Government employment services	1	2	3
High schools or colleges	1	2	3
Private employment agency or search firms	1	2	3
E-mail or Internet	1	2	3

APPENDIX E:

Employee Compensation Information Survey

Employee Name _____ Years of Dairy Experience _____

Years with Farm _____ Years in Current Position _____

Highest Degree Achieved
Some HS HS Some College AS BS MS PhD

Level 1 Level 2 Level 3 Level 4 Level 5

Salaried Hourly Hourly Wage (if applicable) _____

Annual Cash Wage _____ Avg. Hours Worked per Week _____

Annual House Rental Value _____ Annual Health Insurance Value _____

Employer Contribution to Retirement Plan _____ Day __ Night __ Swing ___

Any additional bonuses or perks this individual receives and the approximate annual cash value of each:

This individual's job title would best be described as:

Herd Manager
Assistant Herd Manager
Milker
Barn Manager
Feeder
Mechanic
Machinery Operator
Calf Manager
General Farm Worker
Crops Manager
Heifer Manager
Milking Manager

This person's key responsibilities include (check all that apply)

Crop Responsibilities

Crop Management
General Cropwork
Operating Machinery
Machinery Repair and Maintenance
Soil Management
Applying Chemicals
Silo Management

Herd Responsibilities

Herd Management
General Herdwork
Formulating Rations
Feeding
Heifer Management
Milking
Heat Detection
Breeding
Herd Health
Calf Management

General Responsibilities

Facility Maintenance
Manure Management
Scheduling
Record Keeping
Training Employees

BIBLIOGRAPHY

Belcher, D. (1974). Compensation Administration. Edgewood Cliffs, New Jersey: Prentice-Hall.

Benge, E. and Hickey, J. (1986) Morale and Motivation. New York: Franklin Watts.

Billikopf, G. (1994). Labor Management in Agriculture: Cultivating Personal Productivity. Agricultural Extension: University of California.

Billikopf, G. (1984). Why Workers Leave Dairies. University of California APMP Research Papers, Volume 38, no. 9, pp.26-28.

Bitsch, V. (1996). "Job Satisfaction During Apprenticeship." Acta Horticultural, 429, p. 97-102.

Borman, W. (1978). Measuring Motivation and Job Satisfaction in a Military Context. U.S. Army Research Institute for the Behavioral and Social Sciences. Technical Paper No. 309.

Cooper, D. (1998, February 10). A Positive Image Helps Attract Employees. Hoards Dairyman.

Fogleman, Sarah L. (1999, January). Employee Compensation and Satisfaction on Dairy Farms in the Northeast, M.S. Thesis, Cornell University.

Freund, J. E. and Perles, B. M. (1974). Business Statistics: A First Course. Edgewood Cliffs, New Jersey: Prentice-Hall.

Gerhart, B. et al. New Directions in Compensation Research: Synergies, Risk, and Survival. Working paper, 95-27. Center for Advanced Human Resource Studies, Cornell University.

Gisser, M. and Davila, A. "Do Farm Workers Earn Less?" American Journal of Agricultural Economics. 80(November 1998):670-679.

Gujarati, D. (1995). Basic Econometrics. New York: McGraw Hill.

Howard, et al. (1989, December) Human Resource Management on the Farm: Attracting, Keeping, and Motivating Labour on Ontario Swine Farms. Working paper, WP89/21. Department of Agricultural Economics and Business, University of Guelph.

Indik, B. The Motivation to Work. Rutgers University. Institute of Management and Labor Relations.

Lawler, E.E. (1994). Motivation in Work Organizations. San Francisco, California: Jossey-Bass Inc.

Maloney, T. and Woodruff, S. Wages and Benefits of Full Time Non Family Employees on Larger Than Average New York State Dairy Farms. October, 1989. Cornell University, A.E. Res. 89-20.

Marshall, D. (1978). Successful Techniques for Solving Employee Compensation Problems. New York: John Wiley and Sons.

McGonigal, J. "Farm Employment Project Report." March 1998.

Milligan, R.A. and Maloney, T. (1996). Human Resource Management for Golf Course Superintendents. Chelsea, Michigan: Ann Arbor Press.

Nadler, D. (1977). Feedback and Organization Development: Using Data-Based Methods. Reading, Massachusetts: Addison-Wesley Publishing.

New York State Department of Agriculture and Markets. Agricultural Statistics, 1997-1998. New York Agricultural Statistics Service, August 1998.

Owen, D.B. (1962). Handbook of Statistical Tables. Reading, Massachusetts: Addison-Wesley.

Paul, W.J. and Robertson, K.B. (1970). Job Enrichment and Employee Motivation. London: Gower Press.

Quintanilla, C. (1998, June 4). Scenes From the Insane Job Market of 1998: College Recruiting Becomes Lavish. The Wall Street Journal.

Rock, M. (1984). Handbook of Wage and Salary Administration. New York: McGraw-Hill.

Schuler, R. (1998). Managing Human Resources. Cincinnati, Ohio: South-Western College Publishing.

Sokal, R. and Rohlf, F.J. (1969). Biometry: The Principles and Practice of Statistics in Biological Research. San Francisco: W.H. Freeman and Company.

Sokal, R. and Rohlf, F.J. (1969). Statistical Tables. San Francisco: W.H. Freeman and Company.

Staw, B. (1991). Psychological Dimensions of Organizational Behavior. New York: Macmillan Publishing Company.

United States Department of Labor, Bureau of Labor Statistics. (1998, June). Local Area Unemployment Statistics.

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