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Managing Labor on Dairy Farms: A Resource-Based Perspective with Evidence from Case Studies*

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Abstract

Labor management practices in agriculture are a marginally and fragmentally researched subject with limited theoretical background in agricultural economics. The resource-based theory is proposed as a framework to analyze labor management on farms and its application discussed with evidence of six case studies. In-depth interviews with farm managers, supervisors, and non-supervisory employees provide data to illustrate the provisions of the resource-based theory. The theory requires heterogeneity, immobility, value, rareness, inimitability, and non-substitutability for resources to contribute to sustained competitive advantage. The human resource system of the case farms satisfies these conditions and hence qualifies as a source of competitive advantage.

Keywords: human resource management, resource-based theory, sustained competitive advantage, dairy farms, hired farm workers

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Introduction

Changing farm structures in the dairy industry are reflected in declining farm numbers and increasing farm sizes (Hadley, Harsh, and Wolf; Tauer and Mishra). Milk production in the U.S. increased by 11% from 1994 to 2002 and milk production per cow increased by 16% in the same period, while the number of dairy farms decreased by 41% from 1993 to 2002 (USDA). Growing competition has led to continuing consolidation and increasing reliance on hired labor (Hadley, Harsh, and Wolf; Stahl et al.). Availability of employees is the most common pre-expansion labor management challenge for dairy farmers. Problems after expansion include evaluating employees, achieving performance goals for employees, finding qualified employees, and training (Hadley, Harsh, and Wolf). After expansion, dairy farmers spent less time on farm work and more time managing employees, which they perceive as a key challenge (Bewley, Palmer, and Jackson-Smith). With increasing herd sizes, labor becomes more specialized, employees are expected to be more productive, and competition for skilled labor increases (Reed).

Before 1990 labor management has been of limited interest for agricultural economists (Howard and McEwan). During the 1990's and after 2000 more efforts were devoted to empirical research on agricultural labor. Studies concentrated on distinct personnel management functions, such as recruitment and selection (Maloney, Milligan, and Petracek), compensation (Billikopf 1995, 1996; Billikopf and Norton; Fogleman et al.; Howard et al.), and employee retention (Thilmany). Research on integration of practices and farm level outcomes is in the beginning stages (Bitsch 2004; Bitsch and Harsh), resulting in a limited understanding of how practices interact and impact farm performance. In addition, studies have not built on issues raised in previous research and have not been guided by theory. Most studies were published either as conference or working papers, not in peer reviewed journals.

The purposes of this study are to (1) describe the labor management practices of dairy farmers and (2) to identify whether and how those practices contribute to farm competitiveness. Given the limited availability of prior research in agriculture, the nature of the study is explorative, employing qualitative research methods. Based on focus group discussions with dairy farmers (Bitsch, Harsh, and Mugeru), the study focuses on significant labor management choices of farm operators. Specifically, the study addresses the following issues: (1) mission and goals, (2) recruitment and selection, (3) orientation and training, (4) compensation systems, (5) employees' mistakes and discipline. In addition, outcomes, such as voluntary turnover and termination, are subject to analysis.

A Theoretical Framework for Labor Management: The Resource-Based Theory

Wright and McMahan examine theoretical perspectives for explaining labor management practices in organizations, including the resource-based theory. The purpose of the resource-based theory is to explain how a firm can achieve competitive advantage from its distinct resources. Applied to labor management, the resource-based theory focuses on understanding the relationships between firm strategy, management practices, and the human resource capital pool, i.e., knowledge, skills, and abilities of employees, to create a competitive advantage for a firm (Wright, Gary, and Abigail; Barney and Wright). In the strategic management literature, competitive advantage is defined as a value-creating strategy that is not simultaneously implemented by competitors. Sustained competitive advantage occurs when current or potential competitors are not implementing a similar value-creating strategy (Barney). A sustained competitive advantage is expected to lead to superior performance. According to Paauwe and Boselie, the resource-based theory is the dominant approach in empirical studies of the relationship between labor management practices and performance (e.g., King and Zeithaml; Koch and McGrath; Wright et al.; Wright, Smart, and McMahan).

The resource-based theory posits that competitive advantage can only occur when a firm's resources are heterogeneous and immobile (Barney; Peteraf). Four additional conditions are required to obtain a sustained competitive advantage: (1) the resources add value to the firm; (2) the resources are rare among current or potential competitors; (3) the resources are imperfectly imitable; and (4) the resources are not strategically substitutable (Wright and McMahan; Barney). Dierickx and Cool specify three conditions for resources to be imperfectly imitable: (1) human interactions lead to a complex situation (i.e., social complexity); (2) the link between the resources and the firm's competitive advantage is not well understood (i.e., causal ambiguity); and (3) the ability of the firm to obtain resources is dependent on unique historical conditions (i.e., path dependency). Figure 1 presents an overview of these conditions.

Coff points out that firms can only achieve a sustainable competitive advantage if they are able to cope with the associated management dilemmas of employees' threat of voluntary turnover, demand for higher or more equitable wages, rejection of authority, becoming unmotivated, and the need to be satisfied with supervision, coworkers, and opportunities for advancement. Human resource systems can also contribute to organizational vulnerability and competitive disadvantage in four different ways (Lado and Wilson): (1) human resource managers may have a too narrow focus to contribute effectively to the formulation and implementation of a strategic vision and organizational objectives; (2) a firm's recruitment and selection system may result in hiring individuals who do not possess the requisite knowledge, skills, and abilities or selection of individuals whose values and beliefs are

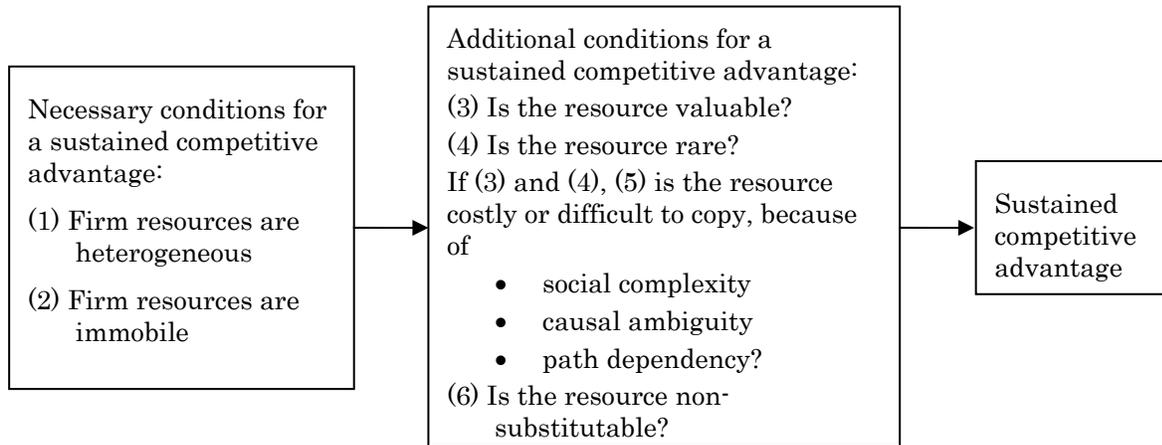


FIGURE 1: Conditions of Sustained Competitive Advantage According to the Resource-Based Theory

incongruent with the organization's values and beliefs; (3) employees may engage in routine behaviors perpetuating the status quo, such as providing justification for poor performance rather than improving performance; and (4) system characteristics such as rules, policies, and procedures may result in employees becoming passive, apathetic, and feeling powerless after experiencing frustration.

Despite this critique, the resource-based theory explains sustained differences in firm profitability that cannot be attributed to differences in industry conditions (Peteraf). The theory provides a useful framework for deciding how to structure the human resource system, because it advocates achieving sustained competitive advantage through internal resources within managers' control. Managerial activity can be guided by this approach to select, develop, and motivate employees to efficiently contribute to firm goals. As the resource-based theory has not yet been applied to small businesses, particularly under the unique agricultural conditions, this study explores the fit of the theoretical propositions with the agricultural context in dairy farming.

Material and Methods

Survey is the most common research method in empirical studies of agricultural labor management (e.g., Bewley, Palmer, and Jackson-Smith; Billikopf 1995, 1996; Billikopf and Norton; Hadley, Harsh, and Wolf; Maloney, Milligan, and Petracek; Maloney and Milligan; Maloney; Reed; Rosenberg, Perloff, and Pradhan).

Complementary to these studies, this study employs a qualitative case study design to add to the methodological pluralism in the study area (Kennedy and Luzar; Bitsch 2000, 2005; Sterns, Schweikhardt, and Peterson). The case study approach is appropriate, because the study investigates a contemporary phenomenon, labor management on dairy farms, and seeks an in-depth understanding of the phenomenon within the framework of the actors involved (see Westgren and Zering;

Yin for other uses of case study research). Case study results can, however, not be generalized to a population, but to theoretical propositions (Yin). Several of the above mentioned survey studies also suffered from a similar caveat in not being representative of the respective farm populations. This study's generalizability is further restricted due to a small number of cases and their wide variability in size and labor management practices, for which more replications would be desirable.

Based on focus group discussions of labor management practices with dairy farmers (Bitsch, Harsh, and Muger), three sets of open-ended questions for different types of respondents have been developed (managers, herdsman, non-supervisory employees). Interviewing multiple respondents in each case serves to gather evidence for data triangulation (Bitsch 2005) and to avoid caveats of not including the employees' point of view (Marchington and Grugulis).

Cases have been selected to include information-rich cases and farms of different sizes to identify common patterns. A list of twenty Michigan farms with hired labor has been compiled with the help of extension agents. Based on the above criteria, farmers' willingness to participate, resource constraints, and location, six cases were selected.

Case materials consisted of on-site interviews, conducted during spring 2003, additional phone interviews, and secondary data (e.g., personnel policy guidelines). Managers of each farm have been asked to suggest a herdsman or supervisor and at least one non-supervisory employee to be interviewed. While this practice may have introduced bias through the managers' choice of interviewees, other approaches could not gain cooperation. On-site interviews have been conducted by three interviewers simultaneously: one interviewer interviewed managers, the second interviewer herdsman, and the third interviewer non-supervisory employees.

Interviews have been conducted in private with each respondent and took between forty-five minutes and two hours. Interviews have been tape-recorded and when the recording was incomplete, interviewers wrote summaries. In total, twenty individuals participated, seven managers, six herdsman, and seven non-supervisory employees. Interviewees were predominately male, except for two female managers.

A project was created, using qualitative data analysis software (ATLAS.ti), where all research data, i.e., transcribed interviews, interviewer notes, and other material, were linked. After an initial exploration of the data, codes were developed. The codes were linked to quotations of the interviewees and the notes, and grouped into labor management themes. For each of the themes coded, a within case analysis compared the statements of the different respondents. In the next stage, different cases were contrasted to identify similarities and differences. Results were then organized to illustrate and discuss the application of the resource-based theory to agricultural labor management.

Results and Discussion

All six case farms were family-owned and operated. The number of cows milked ranged from 225 to 3,200 with an average of 961. Milking practices varied: four farms had three milk shifts; two farms had two shifts. The number of fulltime employees ranged from five to 75, with 21 on average. Overall, employees of Hispanic descent comprised 49% of the total workforce. On average, one fulltime employee was hired per 52 cows milked; full-time employees worked between 50 and 78 hours per week. According to farmers' estimates, case farms averaged \$193,000 in gross revenues and \$36,000 in gross labor expenses per fulltime employee, in 2002; gross labor expenses ranged from 15% to 30% of gross revenues, with a 20% average (table 1).

Table 1: Descriptive Statistics of the Case Farms (n=6)

	Minimum	Mean	Maximum
Cows milked per day	225	961	3,200
Number of fulltime employees	5	21	75
Hispanic employees (%)	29	49	88
Number of cows/fulltime employee	37	52	68
Gross revenue/fulltime employee (\$1000)	130	193	248
Gross labor expenses/fulltime employee (\$1000)	31	36	40
Gross labor expenses/gross revenue (%)	15	20	30

Farm Strategies and Operational Goals

To achieve competitive advantage, a mission statement and operational goals provide a road map for dairy farmers, on how to deploy, develop, and manage their labor. Lado and Wilson, referencing several authors, note that enterprises with a well-articulated mission statement have the potential to achieve sustained competitive advantage over those that lack it. The mission statement defines the strategic intent of the firm and the operational goals specify how the firm expects to achieve its mission.

Two farms had written mission statements. On three other farms, respondents were able to verbally define the future direction of their farm enterprises. Expansion was the main focus in four cases while two cases wanted to maintain current size. Table 2 summarizes the farm goals of each case. Expansion-related goals included increasing herd size, increasing the number of cows milked, and building new facilities. Two managers wished to expand their farms but maintain the number of employees, suggesting that they expected labor efficiency to increase with larger herd size. Five farms had dairy management goals that are measurable and specific.

Table 2: Dairy Farm Goals

Dairy Farm	Case A	Case B	Case C	Case D	Case E	Case F
Business strategy goals						
○ Expand business in the long-run	✓	✓	✓			✓
○ Maintain current size				✓	✓	
○ Reduce operational costs			✓	✓		
○ Maintain sound financial position				✓		
Dairy management goals						
○ Keep the cows healthy	✓	✓	✓		✓	✓
○ Produce high quality milk		✓	✓	✓	✓	✓
○ Increase total milk production		✓	✓	✓	✓	✓
○ Improve milk yield per cow			✓	✓		✓
○ Increase cows' conception rate		✓	✓	✓	✓	✓
○ Reduce mortality rate of calves		✓	✓	✓		✓
○ Maintain clean parlor				✓		
Employee management goals						
○ Reduce employee turnover		✓				
○ Conducive workplace for employees				✓	✓	
○ Improve training		✓	✓			✓
○ Comply with OSHA regulations					✓	

Heterogeneous Demand and Supply of Human Resources

The skills and knowledge required to work on a dairy farm are different from what is required to work on other types of farms. Jobs on dairy farms also vary widely, as employees specialize in different tasks, such as milking, feeding, or calf rearing. In one case, a non-supervisory employee desired to be trained in animal healthcare to administer treatments. In addition to these internal differences, employees' competencies across the six cases were heterogeneous due to differences between training programs.

Individuals differ in their knowledge, abilities, skills, experience, and commitment. Three farms hired herdsmen with college degrees in dairy science as opposed to individuals with no formal dairy education. Employees with prior work experience on dairy farms were preferred to those without. Therefore, the cases provided evidence of both heterogeneous demand for and supply of human resources.

Immobility of Human Resources

Resources are immobile when they cannot be transferred easily from one farm to another. In two cases, non-supervisory employees with proven capabilities were promoted to supervisory positions. Hiring from the internal labor market enabled managers to overcome the problem of adverse selection in hiring. Internal hiring also deterred the transfer of specific skills and knowledge from one farm to another.

Three farms trained their employees in specific milking routines (standard operating procedures). Koch and McGrath suggest that people carry out repetitive tasks by relying on procedures rather than conscience or memory. This means that they are not aware of and cannot articulate routines even if they are intensely involved in carrying them out. Routines result in immobility of knowledge and skills because they are the result of cumulative experience and practice. On-the-job training equipped employees with farm specific knowledge and skills that were not readily transferable. Routines became a form of storage of farm specific knowledge and skills.

Koch and McGrath also argue that heterogeneity and routines specific to a firm prevent an employee trained in one firm from being of equal use to another firm. Routines are based on the context where they emerge (Cohendet and Llerena). Execution depends on this context, i.e., the physical equipment and work environment. Routines result from repeated interactions between individuals in an organization. Thus, the relationships between individuals are important for the execution of routines. Because the milking routines varied between dairy farms, newly hired employees were trained how to milk regardless of their prior experience, in all cases. Those routines remained on the farms where they were developed and could become a source of competitive advantage.

Trained employees have higher replacement costs because they supply services that cannot be immediately provided by newly hired employees. Managers strive to retain those employees through offering job security, higher compensation, and good interpersonal relationships that lead to their immobility. For example, two herdsmen reported that they would not accept alternative employment because of their relationships with managers. Two other herdsmen reported that they would not accept alternative offers because of the job security in their current employment. In contrast, employees in another case reported that the manager threatened them with dismissal by saying they are replaceable by job seekers. Employees without job security were more mobile.

Employees may find their specialized knowledge and skills not transferable to other farms. For example, one employee reported that he was trained to operate an advanced milking machine. Other farms did not use that type of technology and, therefore, his skills and knowledge were not in demand. Employees were also immobile because of the cost of searching for alternative employment and of relocation. For example, employees in one case were not satisfied with their current employment but did not have time to search for alternatives due to rigid work schedules. One employee mentioned the high cost of relocating his family.

Dairy farms differentiated themselves through their benefit packages. Three farms provided healthcare insurance to all employees while two farms provided healthcare insurance to supervisory personnel, only. One farm did not provide healthcare

insurance. Of the three farms that provided healthcare insurance to all employees, two also provided retirement benefits to all employees. For the two farms that provided healthcare insurance to supervisory personnel, one also provided them with retirement benefits. The job tenure of the interviewed non-supervisory employees on farms that provided healthcare insurance and retirement ranged from six to twelve years. On farms not providing healthcare insurance and retirement benefits, their tenure ranged from one to four years.

Farm Employees as Valuable Resources

Managers of dairy farms can create value by either decreasing operational costs or increasing revenue. Employees play a major role in achieving these goals. In five out of six cases producing quality milk was stated as an explicit operational goal (table 2). Employees contributed to this goal by taking measures to ensure a low somatic cell count. Employees also contributed to creating value by striving to achieve other goals such as heat detection, successful insemination, and a low calf mortality rate. Farmers recognized the importance of employees in creating value by rewarding employees, if those goals were achieved. In one case, each employee received a bonus of \$50 each month without calf loss. In another case, positive net returns led to bonuses.

Farmers have to decide whether to develop the competency of employees by training them internally or hire employees who have already acquired the requisite skills on the labor market. In all six cases, managers invested in developing the competencies of their employees, increasing their value to the farms. Also, newly hired employees were matched with experienced employees. Therefore, incumbent employees created value by training new employees and passing on their routines and organizational culture.

Employee referral and word of mouth were the most common recruitment methods. Due to low wage rates in agriculture, the labor market is more likely to provide low quality workers, because high quality workers might be reluctant to change jobs. Hence, farmers preferred to either offer low entry-level wages or hire from a pool of job seekers about whom they can get information. Current employees who recommended applicants provided information on the individuals' work ethics. They created value by enabling managers to avoid hiring low quality employees. Employee referrals also reduced the cost of recruiting. In addition, managers asked their Hispanic employees to recruit other potential employees to overcome the language barrier.

In two cases, reducing operational costs was mentioned as a goal. Those farmers maintained low costs by reducing their labor expenses. In both cases, they limited the hours each employee could work per week. However, a trade-off of lower labor costs was a high incidence of employee mistakes. These mistakes increased

operational costs. In one case, employees mixed standard milk with milk from treated cows. In three cases, employees failed at least once to connect the milking machine to the milk tank. In one case, the value of the lost milk was estimated between \$2,500 and \$3,000.

Farm Employees as Rare Resources

The resource-based theory posits that a resource must be rare to be a source of competitive advantage. Dairy farmers reported difficulties in recruiting employees with the requisite skills and knowledge (Hadley, Harsh, and Wolf). They hired semi-skilled individuals and trained them. To develop a deeper understanding of specific tasks, duties, and responsibilities and become proficient takes time (Lado and Wilson). With training and experience, employees become both valuable and rare resources.

Five cases hired selectively, looking for individuals compatible with current employees and with the aptitude to learn and work on a dairy farm. For example, one employee was terminated for inflicting injuries on cows, suggesting that employees who work well with cows are a rare resource. Tasks allowed for variance in individual performance. Some individuals were more productive than others and a few farmers retained productive employees, even if they had reasons to terminate them. For example, an employee who had been in jail on different occasions was rehired, because he was able to identify sick cows, indicating that certain skills are rare among employees.

In addition, dairy farms depended increasingly on immigrant labor. Newly immigrated, typically Hispanic employees comprised almost half of the workforce on the case farms (table 1). Farmers who had made the transition from hiring local employees to immigrant employees did not want to revert to the local workforce. One manager reported that, currently, seven Hispanic employees completed the same workload that previously required thirteen employees. This evidence supported the notion that skilled and knowledgeable employees who liked working on a farm were a rare resource.

The Human Resource System as Imperfectly Imitable

Sustained competitive advantage is the result of the strategic combination of the labor management practices and the human resources (Boxall). The integration of different labor management practices and human resources results in a unique human resource system. Path dependency, social complexity, and causal ambiguity contributed to farms developing distinct human resource systems that were not imitable.

Social Complexity

Managers selected and hired non-supervisory employees based on their kinship and friendship ties with current employees because they wanted to staff their farm with compatible employees. The resource-based theory explains hiring related employees in the context of team development. When a team of new employees is formed, there is considerable confusion with respect to who is supposed to do what, what information will be required for each person to perform their tasks, and what are their appropriate roles. This confusion arises because employees lack knowledge about each other's aptitudes, motivation, and level of commitment. They lack the history of repeated interactions which render them predictable to one another and leads to the development of trust. Therefore, time and effort that could be used to perform tasks will be directed to developing a pattern of relationships and building trust (McGrath, MacMillan, and Venkataraman). Employees who are acquainted with each other and belong to the same social group achieve effective teamwork more easily. Turnover and termination were low in cases where selection was based on kinship and friendship ties. Turnover and termination were high in one case where walk-ins were hired. Poor working relationships among coworkers were reported as a cause for voluntary turnover in this case, only.

Managing turnover is an important component in achieving competitive advantage because employees are the repository of a farm's knowledge and skills. Unlike tangible assets, employees can quit at will. Turnover increases the risk of not having enough labor to perform critical production tasks, such as milking and feeding cows. Managers in three cases reported that their worst case scenario was unexpected loss of employees. Three managers reported that they fostered good interpersonal relationships among their employees to manage voluntary turnover. Thus, the relationships among employees and between employees and managers were a source of social complexity.

Causal Ambiguity

Causal ambiguity describes the inability of competitors to identify and imitate the sources of a firm's competitive advantage. For example, a large farm provided higher wages, more benefits, and training opportunities to employees compared to a smaller farm. Yet, employees on both farms reported to be satisfied with their current employment. Another large farm provided competitive compensation and training opportunities to employees. However, in this case, employees were not satisfied and would accept alternative employment offers. Whether employee satisfaction was a result of higher compensation, more training opportunities, or the interpersonal relationships between managers and coworkers could not be determined based on these cases. Therefore, employee satisfaction was a source of causal ambiguity.

Although the entry-level wage rate for all case farms was above minimum wage, rates varied, suggesting that each farm determined its compensation system. Wages and salaries paid to current employees in a given position depended on the characteristics of the employees such as education level, job-related skills, and tenure, and also on the size of the farm. The wage rate of herdsmen on the three larger farms ranged from \$14 to \$20 per hour and from \$12 to \$14 on the three smaller farms. The three larger farms also provided more benefits compared to the three smaller farms. In addition, there was variation of benefits within cases. For example, one employee participated in a retirement plan, while another eligible employee received a cash payment instead. On another farm, an employee had opted to receive cash instead of health insurance. These variations in the compensation system were a source of causal ambiguity. Aware of this fact, a manager of one of the larger farms wanted to know how other farms were able to expand despite low milk prices.

Milking was done in shifts and employees worked in teams. When employees were able to achieve goals (e.g., low somatic cell count, increased milk production), it was difficult to determine the contribution of each team member and attribute superior performance to individual efforts. Therefore, high productivity arising from teamwork production was a potential source of causal ambiguity. Managers could not isolate and reward the individual, nor could competitors hire out the individual.

Path Dependency

The route that the farm took in the past influenced its ability to achieve competitive advantage through its human resource system. For example, one manager mentioned that family values and beliefs determined the farm's organizational culture. Family employees trusted each other and subsequently trusted their hired employees. The manager also said, he had a trusting relationship with his supervisory personnel and did not expect them or the employees they supervised to commit costly mistakes. Wilson and Kennedy argue that the culture of an organization is determined by the values and beliefs of employees and employer. Because of individual differences, trusting relationships vary within and across firms. Trustworthiness, as a productive asset, is developed over time. Investing in trust-based relationships produces advantages where trusting parties will not take advantage of each other because of their repeated interactions. Trust between managers and employees depends on the way managers treated employees in the past.

The resource-based theory posits that expansion is determined by the resources available to a firm and those resources are accumulated over its history. Herdsmen in two cases mentioned that expansion meant increasing the herd size, which depended on employees with knowledge and skills in dairy management. The

potential to expand, therefore, depended on the human resource competencies they developed over time. In one case, the manager trained supervisory personnel for future managerial roles. Unlike managers in other cases, this manager had acquired a formal education in dairy management and business administration. Managers in other cases could not imitate his practices easily.

Farm Employees as Non-substitutable Resources

Employees on dairy farms were non-substitutable resources. All case farms hired year-round fulltime employees because dairy farming could not be fully automated. Even on highly mechanized farms, human resources were needed, e.g., to monitor the herd health, administer treatment, and assist calving cows. Current technology and machinery becomes obsolete over time, but human resources that are constantly educated and trained retain their value. Increasing capital results in an increasing number of cows per employee, but does not replace human resources entirely.

Conclusions and Recommendations

Unlike previous empirical studies that focused on distinct labor management practices, this study explored the integration of various practices (e.g., recruitment and selection, training, compensation) and their outcomes (relationships, voluntary turnover, termination). The resource-based theory argues that firm performance is a function of how well managers build their organizations around resources that are valuable, rare, inimitable, and lack substitutes (Barney). The data reported here support the claim that human resources and the emanating human resource system are potentially the source of sustained competitive advantage for dairy farms. Considering the small number of cases and the variability of labor management practices across the cases, more research is necessary to substantiate these findings. This caveat needs to be kept in mind when considering the application of the following conclusions and recommendations to farm and agribusiness management.

There are no well-developed methods of identifying and measuring the constructs of the resource-based theory, such as social complexity, causal ambiguity, path dependency, and farm specific knowledge and skills (Levitas and Chi), but Coff suggests that imperfect measures still yield useful insights. We want to add, imperfect data may also yield valuable inputs for management practice and future research. The insights gained from this study encompass (1) empirical facts in the field of labor management on dairy farms, based on which hypotheses for future research can be built, instruments for testing these hypotheses can be developed, and management recommendations can be devised; (2) theoretical insights regarding the application of the resource-based theory to labor management, specifically, in agriculture.

Research Implications

This study explored the potential of dairy farms to achieve competitive advantage through the human resource function. For further evidence, other agricultural subsectors should be explored to compare how the dairy context is similar or different from other livestock, plant production, and other agricultural operations. An additional question warranting further research is whether the resource-based theory can be applied in a seasonal context, such as vegetable or bedding plant production, and how year-round operations and seasonal operations differ with respect to managing their labor for competitive advantage.

The resource-based theory was a useful theoretical framework for understanding how human resources of the six case farms were a source of competitive advantage or disadvantage and the role of the human resource system in this process. Considering the small number of cases and variability of their characteristics, further research is required before more definite labor management conclusions can be drawn. To solidify the developed assertions of how to achieve sustained competitive advantage through human resources, future empirical research should test the relationships between the key conditions postulated by the resource-based theory and farm performance. Farmers' perceptions of their competitive performance are not a sufficient measure for this purpose. As seen in this study, the farm manager's perception may not match employees' perceptions or external measures of competitiveness. Ideally, several performance measures should be used. To test and quantify the relationships between the human resource system and performance, a representative sample of the dairy industry and, as a next step, other agricultural industries will be required.

The results show several venues to improve the measurement of the theoretical concepts. Interpersonal relationships among employees and between employees and managers can be used as proxies for social complexity. Those relationships are based on kinship and friendship ties and therefore not easy to imitate. The ability of employees to recruit job applicants can be a measure of social networks. The inability of managers to identify an individual's contribution in teamwork production was used as an example of causal ambiguity. The development of trust between managers and herdsman through repeated interactions was used as an example of path-dependency. On-the-job training of all newly hired employees was used as an indication of farm specific knowledge and skills. These and similar examples, gained through the richness of the data provided through the case study approach with in-depth interviews, can be used to develop survey items for future research. Developing measurement concepts for key conditions is a prerequisite of testing the resource-based theory quantitatively. Based on the examples accumulated in this study, survey instruments (e.g., Likert scales) can be developed for representative empirical studies. Examples from the case studies can be

combined with scales of other studies, which need to be adapted to the agricultural context (e.g., Dyer and Chu; King and Zeithaml).

Finally, the theoretical framework can be simplified for testing purposes. The conditions of a resource being valuable and rare contribute to the resource being heterogeneous (Barney; Lado and Wilson). Meeting the condition of not being easy to imitate also contributes to a resource being immobile. Therefore, to empirically test the application of the resource-based theory to human resources and analyze the relationship between the human resource management system and farm performance, it will suffice to test whether human resources meet the four conditions of being valuable, rare, imperfectly inimitable, and having no strategic substitute.

Management Applications

Across case comparisons of the labor management practices indicated that each case had a distinct human resource system emanating from its organizational culture, kinship and friendship ties, and resource endowment. Organizational outcomes, such as voluntary turnover and termination rates, employee satisfaction, and manager satisfaction did not stem from single or isolated labor management practices. While recruitment through employee referrals and selection of new hires with ties to incumbent employees was reported to result in compatible teams, other practices like compensation and training, together with the organizational culture influenced the outcomes. Therefore, in each case, the manager had the potential to develop his or her own unique human resource system as a source of sustained competitive advantage. On the other hand, inadequate or inconsistent labor management practices may lead to a considerable competitive disadvantage for the affected farm.

Managers who plan to expand their operations need to be prepared for post-expansion labor management challenges. Previous studies indicated that an increase in herd size led to labor efficiency but also increased these challenges (Bewley, Palmer, and Jackson-Smith; Hadley, Harsh, and Wolf). To fully realize the potential advantages of expansion, labor management practices need to be developed to fit with strategic goals and the current workforce. Attending training programs on labor management is recommended to increase management skills in this area and attain the skills to use the human resource system as a source of sustained competitive advantage, mobilizing, developing, managing, and retaining employees.

Based on the resource-based theory and the analysis of the six participating farms, several labor management recommendations can be suggested. In addition to taking into account the small sample size, managers need to consider their management philosophy before adopting any of the suggested practices. Managers who perceive

their employees primarily as a cost factor may find the following practices less useful. However, managers who focus on employees' contributions and improving the use of their potential can discern guidance from the resource-based theory.

A clearly stated mission statement is crucial in guiding employees in day-to-day operations and helping them decide where to put emphasis. While the mission statement needs not be written, it must be clearly and consistently communicated to all employees. Most employees value taking part in accomplishing goals beyond their daily work routines. Engaging them in setting short-term goals in their jobs makes employees feel more appreciated, and thereby facilitates their contribution to overall performance and increases commitment.

Long-term competitive advantage depends on either decreasing operational costs or increasing revenues or both. Employees are better able to contribute to these goals when trained comprehensively. Sound training decreases costs through helping to avoid costly mistakes. In addition, well trained employees are more likely to actively develop ways to save costs and increase efficiency. While some farmers seem concerned that additional training and professional development will make their employees more competitive on the job market, investment in employees tends to increase their commitment to their employer and forge closer ties.

A competitive compensation package also increases retention and fosters loyalty of qualified employees. Although wages are an important factor in most employees' reckoning, benefits, such as paid vacation, health insurance, and retirement plans should be considered as well. Bonuses are a flexible way to reward desired behaviors and employee accomplishments. They also serve to closely align employees' goals with business objectives and overall mission.

Trust-based relationships and cohesive work teams are a key factor in utilizing employees' skills, knowledge, and experience for competitive advantage. During the hiring process, selection criteria which emphasize not only job tasks but also fit with the current workforce and the overall mission facilitate team building. In this respect, formal systems, such as job descriptions, may not necessarily be an advantage, but explicit selection criteria and team involvement in the selection process are beneficial. One way to develop trust is through social interaction among coworkers, workers and supervisors, and owners and employees. Nurturing relationships, as well as, social ties contribute to a cohesive work environment, which enables employees to work more productively and reduces turnover. Another way to cultivate trust, without necessarily being socially close, is through repeated interactions of managers and employees at the workplace. Fair and respectful treatment and personnel management skills will reassure employees that they will not be taken advantage of and motivate them to behave in a similar way.

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