

# VITAL CAPITAL INDEX FOR DAIRY AGRICULTURE, VERSION 3.0 (DRAFT BETA 3 FOR PEER REVIEW)

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Andrew Whitman

[awhitman@manomet.org](mailto:awhitman@manomet.org)

Manomet, 14 Maine Street, Suite 410, Brunswick ME 04011

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## INTRODUCTION AND PURPOSE

Manomet, in collaboration with Agri-Mark/Cabot Creamery Cooperative (Agri-Mark), conceived of the **Vital Capital Index for Dairy Agriculture** (VCI) as a tool to help dairy farmers assess, benchmark, and manage the sustainability performance of their farms. Equally important, the VCI provides results that dairy farmers can use to communicate efforts of continuous improvement with a variety of stakeholders. The VCI is composed of practical, field-tested, science-based indicators developed to address a wide range of sustainability topics. This document is a beta version of VCI 3.0 that is currently under review by selected dairy farmers from the northeastern U.S. Two prior versions of the VCI have been developed and field tested.

Vital Capital refers to the five key capitals that are essential for human well-being and sustainability:

- *Natural Capital* is any stock or flow of energy and material that produces goods and services and is synonymous with ecosystem services (e.g., resources, processes).
- *Human Capital* consists of people's health, knowledge, skills and motivation which are vital to productive work.
- *Social Capital* consists of the institutions that help us maintain and develop human capital
- *Built or Manufactured Capital* is composed of material goods or fixed assets which contribute to infrastructure and the production process.
- *Financial Capital* is the money which plays a key role in our economy, enabling the other capitals to be owned and traded.

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## BACKGROUND

In 2013, Manomet, in partnership with Agri-Mark, launched version 3.0 of the online Vital Capital Index (VCI) to aid dairy farmers with benchmarking their sustainability and managing twelve key topics of stewardship (Table 1). With support from the Innovation Center for Dairy Agriculture, Manomet developed a beta VCI through discussions with dairy farmers and by reviewing dozens of leading farm sustainability frameworks, and then synthesizing those findings with review from industry experts. Version 3.0 is a confidential tool that begins with 12 questions of “Awareness” on key sustainability topics, and then will drill deeper on a topic-by-topic basis into three additional modules. The VCI’s four modules together are identified as M.A.P.P.S. – for the *Manomet Awareness, Practice, Performance and Sustainability* process. [Please note: VCI Module 1, the Awareness level, is “live”; the other sections are currently in development]. The VCI uses a go-at-your-own-pace approach, including the ability to easily enter and exit the tool. Ultimately, the VCI provides a snapshot of a farm’s sustainability story as well as a roadmap for a farm’s stewardship opportunities. The VCI takes a triple-bottom-line approach by covering economic, social and environmental components of sustainability. It takes dairy farmers about 15 minutes to complete Module 1 of the VCI. This document contains draft indicators for modules 2, 3, and 4 for review. A draft of the complete VCI has already been reviewed in the field on four pilot farms.

Pressing environmental and social issues related to dairy agriculture are occupying more and more of dairy farmers' time. The VCI was designed to help dairy farmers tackle these challenges by addressing a dozen core sustainability topics ranging from farm management to food safety to water stewardship. Farmers can use it as a benchmarking tool to track their continuous improvement. The results can help farmers communicate their sustainability story to supply chains and neighbors alike. Most importantly it allows farmers to be comprehensive and develop sensible strategies for tackling these challenges while enhancing the viability and stewardship of their operations.

**Table 1. The triple bottom lines and twelve sustainability topics in the Vital Capital Index for Dairy Agriculture, beta v.3.0.**

Triple Bottom Lines	Related Twelve Topics
Prosperity	
	Business Oversight and Strategy
	Farm Management
	Review of Farm Operations
People	
	Farm Family Well-being
	Consumer Well-being
	Employee Well-being
	Local Community Well-being
Planet	
	Animal Care and Well-being
	Land Stewardship
	Ecosystem Conservation
	Energy, Waste, and Greenhouse Gas Emissions
	Water

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## DESCRIPTION OF MODULES 1, 2, 3, AND 4

The VCI has four modules that provide the platform upon which farmers can take a business-based approach to sustainability (Figure 1). The underlying indicators were field-tested and are practical and science-based.

### MODULE 1: AWARENESS

A farmer can use Module 1 to identify their awareness and engagement on key sustainability topics. In Module 1, each indicator question has four possible responses. The user selects the one response that best describes the degree with which a key sustainability practice has been applied on their farm. The four possible responses are scored between 0 and 0.8 points per topic, with a total maximum of 10 points across the entire module (including 0.4 points for participating). A higher score indicates that a user has a high level of awareness of these key farm sustainability topics.

### MODULE 2: PRACTICE

Module 2 is composed of indicators to identify the various sustainability practices a dairy farmer might apply to their farm. Each indicator is a question regarding use of a list of related practices. Each practice has a weighed score based on the extent to which it might improve outcomes relevant to a specific topic. For each topic in Module 2, the scores of all responses to an indicator question are summed up. Total scores for each topic can range from 0 to 10 depending on which practices have been identified. A farmer can use Module 2 to benchmark practices and self-assess which additional ones might be considered in order to enhance their operations. A high score simply indicates that a user identified many sustainability practices in place on their dairy.

### MODULE 3: PERFORMANCE

Module 3 is composed of two types of performance indicators: (1) *Key Management Indicators* which describe the performance or level of the management around a specific topic, and (2) *Key Performance Indicators* describing the performance regarding a specific topic. *Key Management Indicators* score from 0 to 10. A “0” indicates no management practices are in place with regard to the topic; a “10” indicates strong management practices are in place to manage dairy farm risks. The *Key Management Indicators* are intended to capture key, holistic synergies among practices that can enhance the sustainability of a dairy. High scores indicate that a strong system is in place for managing a specific topic.

*Key Performance Indicators* have their own units and will include benchmarks from other sources in the future. Many of the *Key Performance Indicators* are widely in use in dairy agriculture already. Although the levels of both types of indicators are directional, what is sustainable is undefined as this could vary among dairy farms. A farmer can use Module 3 to assess and track continuous improvement on their farm performance over time.

### MODULE 4: SUSTAINABILITY

Using a context-based approach<sup>1</sup>, Module 4 allows farmers to see if they are sustainable for key topics. These indicators measure farm or business performance in terms of impacts on vital capitals, relative to current

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<sup>1</sup> McElroy and van Engelen 2012.

standards or norms (legal or broad-based social) in order to ensure stakeholder well-being<sup>2</sup>. We include context-based metrics for sub-topics wherein farmers may have obligations or responsibilities to themselves and/or other stakeholders (e.g., suppliers, employees, neighbors, consumers, et al.), typically following legal requirements and based on our interpretation of strongly prevailing social norms. For some topics, we determined that farmers do not currently have legal requirements or clear responsibilities and so did not include a context-based metric.

Figure 1: The four modules of the Vital Capital Index for Dairy Agriculture, beta v.3.0. Each of the 12 topics have indicators in each module.



<sup>2</sup> McElroy and van Engelen 2012.  
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## PROSPERITY

Farm prosperity is the state of having a financially successful farm and is an essential starting point for farm sustainability. It is key to the financial viability for the farm business and farm family. Financially-successful farmers are better able to produce wholesome milk, to add to local well-being, and be good environmental stewards. Their farms also contribute to the local economy. Key topics of managing for farm prosperity include farm business oversight and strategy, farm management, and review of farm operations. This follows the PDCA cycle (for Plan, Do, Check, Act) which is widely used for managing for continuous improvement and adaptive management efforts in business and elsewhere<sup>3</sup>.

### TOPIC #1 - BUSINESS OVERSIGHT AND STRATEGY

Business oversight is the management and supervision of farm operations to achieve desired goals. Effective oversight addresses key issues which reduces business risk and can enhance profitability. Sustainable business strategy is a long term action plan designed to achieve owner financial goals while enhancing the sustainability of the dairy farm.

#### 1.1 AWARENESS INDICATOR

A business plan is a map of strategies to help you achieve profitability and personal goals for your business. Loan agreements often include the basic information found in a business plan and can also help you achieve your business goals.

- 1.1.1. In the last five years, have you completed a business plan and/or loan agreement (0.8 pt)?
- a. Hardly or Not at All (0 pt)
  - b. Somewhat (0.2 pt)
  - c. Mostly (0.5 pt)
  - d. Yes or I don't borrow money for my dairy operation (0.8 pt)

#### 1.2 PRACTICE INDICATORS

##### BUSINESS OVERSIGHT (4 POINTS)

Business oversight or governance includes the methods and practices for ensuring accountability and financial success of the dairy business.

- 1.2.1. Business governance: Which of the following oversight-related practices are applied in the course of running your farm business? (4 pts)
- a. Regularly meet to review progress with other owners, family members, key employees, et al. (0.4 pt)

<sup>3</sup> Shewart 1980. This framework selected based on a suggestion by Brad Swanson, an SBDC counselor in Maine.  
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- b. Have core business values and ethics communicated and followed by employees/family workers and includes a notion of sustainability (including viability and stewardship of resources and people) as a core value (0.4 pt)<sup>4</sup>
- c. Align farm practices with goals for your farm (0.4 pt)
- d. Include decisions and efforts related to operational and financial sustainability into the core farm strategy (0.4 pt)
- e. Either directly or through family members, and/or employees, support or participate in efforts to create performance standards and/or voluntary sustainability programs in the dairy industry (0.4 pt)

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### SUSTAINABILITY STRATEGY (3 POINTS)

A sustainability strategy is a business approach that creates long-term owner value and enhances long-term viability while taking into consideration your employees, your local community, and local natural resources.

1.2.2. Business Strategies: Which of the following strategies are you using to ensure the long-term viability of your core farm business? (3 pts)

- a. Improving the tracking of farm financials (0.4 pt)
- b. Integrating livestock and crop production with an aim toward continuously increasing efficiency (0.4 pt)
- c. Expand innovative practices and use of technology without becoming over leveraged (0.15 pt)
- d. Using tools (e.g., hedging, enrollment in the USDA Margin Protection Program, states programs, etc.) to protect the price of your milk (0.1 pt)
- d. Improving employee/family worker supervision and engagement (0.2 pt)
- e. Reducing energy use and/or increasing use of renewable energy (0.15 pt)
- f. Improving nutrient use efficiency (including feed efficiency) (0.4 pt)
- g. Improving cow care and/or milk quality (0.2 pt)
- h. Improving ability to adapting to weather variation (0.1 pt)
- i. Understanding source of purchased feed and its supply and pricing vulnerabilities (0.1 pt)
- j. Applying new practices to get ahead of changing regulations (0.1 pt)
- k. Reducing the use and/or increasing the re-use and recycling of inputs and materials (0.15 pt)
- l. improving work/private life balance of self, family workers, and employees (0.2 pt)
- m. Applying cutting edge and significantly innovative cropping strategies (0.2 pt)
- n. participate in communicating sustainability efforts of your farm and the dairy industry (0.05)
- o. Have an environmentally preferable purchasing (EPP) policy to procure products such as recycled paper or low impact cleaning chemicals where feasible?<sup>5</sup>
- p. Other1 (please add): \_\_\_\_\_ (0.1 pt)
- q. Other2 (please add): \_\_\_\_\_ (0.1 pt)

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### BUSINESS PLANNING (3 POINTS)

<sup>4</sup> Austin Green Business Leaders Program (2015)

<sup>5</sup> Austin Green Business Leaders Program (2015)

A business plan is your guide to help you achieve financial and personal goals for your farm business. Loan agreements often include some of the basic information found in a business plan and can also help you achieve your business goals. Though a plan often changes, it can help you take stock and get you where you want to go.

1.2.3. Annual Planning: Which of the following annual business planning practices do you apply each year to achieve your business goals (1 pts)?

- a. Prepare an annual budget with projected revenue, expense, and profit, including multiple cash flow budget scenarios (e.g., most likely, best, and worst case) (0.35 point)
- b. Plan for owner's income so that it is sufficient to meet the business owner's needs (0.3 point)
- c. Make projections for production of milk and other agricultural products (0.15 point)
- d. Review and use forward contracting, hedging, Livestock Gross Margin for Dairy (USDA), and/or milk futures to reduce milk or feed price risk when applicable (0.1 point)
- e. Deploy family workers, employees, or contractors to complement your strengths and weakness when applicable (0.06 point)
- f. Other1 (please add): \_\_\_\_\_ (0.02 points)
- g. Other2 (please add): \_\_\_\_\_ (0.02 points)

1.2.4. Information Sources for Planning: In the last five years, which of the following information sources have you used to help you plan or consider new practices or technology to improve your farm business? (0.5 pts)

- a. Business consultants (Small Business Development Center or private counselors) (0.05 pt)
- b. Other farmers (0.08 pt)
- c. Ag. media (trade and farming magazines or web sites) (0.01 pt)
- d. Loan and lending officers (0.5 pt)
- e. Technical consultants such as Feed or crop consultants, equipment dealers, suppliers, milk truck drivers (0.06 pt)
- f. Veterinarians (0.07 pt)
- g. Customers and dairy co-op staff (0.04 point)
- h. Agency or university agricultural advisors and scientists (0.03 point)
- i. Workshops and field demonstrations (0.05 point)
- j. Other1 (add your information source): \_\_\_\_\_ (0.04 points)
- k. Other2 (add your information source): \_\_\_\_\_ (0.02 points)

1.2.5. Key Documents: Which of the following key farm documents do you have on-hand (can be in a safe deposit box) (0.5 pt)?

- a. Deeds and survey maps of properties (0.1 pt)
- b. Loan agreements or I don't have loans (0.1 pt)
- c. Milk contracts (0.05 pt)
- d. Agriculture-related permits and licenses (0.02 pt)
- e. Agreements and maps for leased farmland (0.02 pt)

- f. Farm layout map, including buildings, roads, pasture, cropping areas, fence lines, water bodies, forest, and other non-production areas (0.01 pt)<sup>6</sup>

1.2.6. Business Plan: Which of the following aspects are described in your current (<36 months old) business plan and/or loan agreement (check all that apply)? (1 points)<sup>7</sup>

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<sup>6</sup> Utz Indicator I.A.1 (area map)

<sup>7</sup> Carkner 2000; Utz Indicator I.A.12 (farm management plan)

a. I don't have a business plan or loan agreement (skip this section)

Plan Components	Information button text	I have a plan	I have a written or electronic plan or is N/A
b. Description of farm operation and goals	<i>This can include a concise statement that describes the purpose of your farm business, operational goals, profit goals, and description of your business organization (type of ownership, family involvement, employees/family workers) and farm operations (physical plant, herd, equipment, land base</i>	<input type="checkbox"/> 0.05 pt	<input type="checkbox"/> (0.25 pt)
c. Key farm financials	<i>This can include your balance sheet, cash flow records, and Income statement</i>	<input type="checkbox"/> 0.2 pt	<input type="checkbox"/> (0.3 pt)
d. Farm production plan	<i>This can include a description of your production system, quality control measures, risk management, stewardship efforts, and environmental and legal requirements for operating.</i>	<input type="checkbox"/> 0.2 pt	<input type="checkbox"/> (0.3 pt)
e. A marketing plan	<i>This can include a short description of your marketing relationship with a co-op or list of your products and services, an evaluation of market opportunities, strategies for reducing market risk, a description of how you market and sell your products, and a description of customers and their needs.</i>	<input type="checkbox"/> 0.05 pt	<input type="checkbox"/> (0.05 pt)
f. An organizational management plan (OR is not applicable because only myself and family members run the farm)	<i>This can include a list of employees/family workers, job title/description, and a description of compensation.</i>	<input type="checkbox"/> 0.05 pt	<input type="checkbox"/> (0.05 pt)
g. An emergency response plan <sup>8</sup>	<i>This addresses emergency contact list, power sources, feed and water for cows, veterinary assistance, map of facilities, pastures, utilities lines, water bodies, and storage of chemical and fuel, etc.</i>	<input type="checkbox"/> 0.02 pt	<input type="checkbox"/> (0.03 pt)

<sup>8</sup> Standard DP.b in Assurance Food Safety (2014).

h. A business succession plan.	<i>This can cover replacement of key employees/family workers and/or transitioning the farm to the next generation of owners</i>	<input type="checkbox"/> 0.02 pt	<input type="checkbox"/> (0.02 pt)
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### 1.3 PERFORMANCE INDICATORS

#### KEY PERFORMANCE INDICATORS

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1.3.1. **Business Strategy:** Having an overarching sustainability strategy creates the vision necessary for maintaining your farm operations and ensuring their long-term viability and operational sustainability.

**a. Sustainable Strategy score:**

Sum of score from Sustainable Business Strategy and Governance\*2 (max=10).

1.3.2. **Business planning:** Having a strong business plan can be a key step for creating your practical vision for your farm, tracking progress, and applying discipline to manage for your business goals.

**a. Planning performance:**

Business Plan Score (based Farm Business Plan score \* 2.5, max =10)

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### 1.4 SUSTAINABILITY INDICATOR

Refer to 2.4.1 (adequate profitability and payments of bills)

## TOPIC #2 - FARM MANAGEMENT

Farm management is the making and implementing of the decisions involved in operating a farm to achieve owner goals and profitability. The quality of farm management is most correlated with financial success<sup>9</sup> and so is a critical piece of dairy agriculture sustainability.

### 2.1 AWARENESS INDICATOR

Effective execution of a business strategy and plan can increase economic sustainability and lead to profitability. Improvements in equipment, feed systems, manure management, employee/family worker supervision, cropping, etc., can improve your profitability, though it may take time to realize a desired return on your investment.

2.1.1. In the last five years or as long as you have owned your farm (whichever is shorter), have you implemented practices on your farm each year that have significantly increased your profitability and efficiency, reduced your costs, reduced your financial risk, and/or created new product/market opportunities (0.8 pt)?

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

### 2.2 PRACTICE INDICATORS

Farm management to optimize production and profit, and to achieve your personal goals is a lot of work. It may require diligently implementing and adjusting your plans and having a routine of practices that can help you achieve your farm goals.

2.2.1. Farm Management: Following a routine of key activities that begins with starting projects, assignment of responsibilities, and working through completion can ensure key tasks are well completed. Which of the following key practices do you on your farm (6 pts)?

Farm management

- a. Manage the business strategy and monitor the annual plan and budget to achieve profitability
- b. Identify and watch out for risks related to markets, production, and reputation
- c. Review capital requirements for herd, equipment, and building investment
- d. Address missed scheduling, budget, and performance goals as quickly as possible
- e. Delegate responsibilities to key employees or family workers, or outsource certain tasks
- f. Inspect herd health and assess production
- g. Inspect and maintain milking operations, milk room, and milking equipment
- h. Inspect and maintain other equipment and buildings

<sup>9</sup> Oliver and Erikson 2008, Oliver 2008.  
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- i. Timely purchases of feed, supplies, and equipment
- j. Foster effective relationships with family workers and employees

#### Marketing, sales, and purchasing

- k. Promote and sale of milk and other agricultural products **OR** belong to a co-op which manages marketing and sales of milk
- l. Foster beneficial working relationships with customers to achieve increased income
- m. Foster beneficial working relationships and manage conflicts with contractors and suppliers

#### Continuous improvement and innovation

- n. Foster beneficial relationships with people in dairy industry
- o. Seek out opportunities for continuous learning and education

#### Finance

- p. Manage cash flow including timely payment of bills (e.g., reconciling checkbook monthly)
- q. Foster beneficial relationships with lenders, contractors, and suppliers

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## 2.3 PERFORMANCE INDICATORS

### KEY MANAGEMENT INDICATORS

2.3.1 **Farm Management:** Which of the following best described the level of operational management and continuous improvement for on your dairy (select only one) (10 pts)?

- a. You and/or your managers always manage farm operations carefully at a level that has been well above for the industry in the last five years. Manager(s) routinely inspects herd health and production, maintains milking operations, milk room, and equipment and makes timely purchases of feed, supplies, and equipment. Risks related to markets, production, and reputation are reviewed weekly to monthly. Business strategy and annual plan are reviewed monthly. Planting and harvesting occur in a timely fashion and achieve production goals. Farmer fosters beneficial relationships with people in dairy industry and seeks opportunities for continuous learning and education. Farmer/managers have effective relationships with family workers and employees and delegate when necessary. Negative impacts of operations to financials only occur in some years when milk prices are low (10 pts).
- b. You and/or your managers often manage farm operations carefully at a level that has been above average for the industry in the last five years. Manager(s) routinely inspects herd health and production, maintains milking operations, milk room, and equipment and makes timely purchases of feed, supplies, and equipment. Risks related to markets, production, and reputation are regularly reviewed. Business strategy and annual plan are reviewed monthly. Farmer fosters beneficial relationships with people in dairy industry and seeks opportunities for continuous learning and education. Planting and harvesting occur in a timely fashion and achieve production goals. Farmer/managers have effective relationships with family workers and employees and delegate when necessary. Negative impacts of operations to financials only occur in years when milk prices are low. (8 pts).
- c. You and/or your managers often manage farm operations at a level that has been average for the industry in the last five years. Manager(s) routinely inspects herd health and production, and maintains milking operations, milk room, and equipment, and makes timely purchases of feed, supplies, and equipment. Risks related to markets, production, and reputation are occasionally reviewed each year. Planting and harvesting occur in a timely fashion and usually achieves production goals.



Farmer/managers have effective relationships with family workers and employees but may not delegate effectively. No actual negative impacts of operations to financials are identified. (6 pts).

- d. You and/or your managers typically manage farm operations at a level that has been below average for the industry in the last five years. Manager(s) routinely inspects herd health and production, maintains milking operations, milk room, and equipment and makes timely purchases of feed, supplies, and equipment. Risks related to markets, production, and reputation are not regularly reviewed. Planting and harvesting is variable and often misses production goals. Farmer/managers provide mediocre supervision of family workers and employees. Careful inspections of herd health and production, maintenance of milking operations, milk room, and equipment, and timely purchases of feed, supplies, and equipment necessary to mitigate adverse impacts to operations only occur in times of financial and production difficulty (2 pts).
- e. You and/or your managers typically manage farm operations at a level that has been well below average for the industry in the last five years. Risks related to markets, production, and reputation are not regularly reviewed. Planting and harvesting is variable and often misses production goals. Farmer/managers provide poor supervision of family workers and employees. Adequate inspections of herd health and production, maintenance of milking operations, milk room, and equipment and timely purchases of feed, supplies, and equipment necessary to mitigate adverse impacts to operations do not regularly occur (0 pt).

2.3.2 Farm Financial Management: Which of the following best described the level of financial management for on your dairy?

- a. You and/or your managers always manage farm financials carefully at a level that has been well above average for the industry in the last five years. Bills are always paid on time or in advance. Annual budget, financial records and accounts are reconciled monthly or more often to avoid and mitigate risks and adverse impacts to dairy financials and operations. Adjustments are made when income and expenditures deviate from the farm budget. You and/or your manager(s) take proactively strive to achieve excellent business and/or trading relationships with buyers, lenders, contractors, service providers, and suppliers through regular contact and review of key matters (10 pts).
- b. You and/or your managers often manage farm financials carefully at a level that has been above average for the industry in the last five years. Annual budget, financial records and accounts are regularly reconciled to avoid and mitigate risks and adverse impacts to dairy financials and operations. Bills are always paid before due. You and/or your managers maintain regular contact with buyers, lenders, contractors, service providers, and suppliers (8 pts).
- c. You and/or your managers often manage farm financials at a level that has been average for the industry in the last five years. Annual budget, financial records, and accounts are occasionally reconciled. Bills are usually paid before due. No actual negative impacts to financials are identified. You and/or your managers maintain occasional contact with buyers, lenders, contractors, service providers, and suppliers (6 pts).
- d. You and/or your managers typically manage farm financials at a level that has been below average for the industry in the last five years. Neither risks to financials nor their potential impacts to the dairy business are regularly reviewed. Bills are generally are paid before due. Adequate reviews of financial records and contact with commercial relationships necessary to mitigate risks and adverse impacts to financials only occur in times of financial and production difficulty (2 pts).
- e. You and/or your managers typically manage farm financials at a level that has been well below average for the industry in the last five years. Neither risks to financials and milk production nor their potential impacts to the dairy are regularly reviewed. Bills are often not paid before due. Adequate reviews of

financial records and contact with commercial relationships necessary to mitigate risks and adverse impacts to financials rarely ever occur (0 pt).

## KEY PERFORMANCE INDICATORS<sup>10</sup>

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2.3.2. **Liquidity** is the ability of your farm business to meet financial obligations as they come due – to generate enough cash to pay your family living expenses and taxes, and make debt payments on time. Current ratio measures the extent to which current farm assets, if sold tomorrow, would pay off current farm liabilities.

**a. Current liquidity ratio** = Total Current Farm Assets / Total Current Farm Liabilities OR

**b. Quick Cash Ratio** = (Cash + Short-term Securities)/ Total Current Farm Liabilities.

2.3.3. **Profitability** is the difference between the value of goods produced and the cost of the resources used in their production. Operating profit margin shows the operating efficiency of the business. If expenses are low relative to the value of farm production, the business will have a healthy operating profit margin. A low profit margin can be caused by low product prices, high operating expenses, or inefficient production.

**a. Operating profit margin** = (net farm income from operations + farm interest expense - value of operator and unpaid family labor)/gross revenue

2.3.4. **Repayment capacity** shows your ability to repay term debts on time. It includes nonfarm income and so is not a measure of business performance alone.

**a. Term debt coverage ratio** = (Net farm income + Depreciation + Net non-farm income – Family living & income taxes + Interest expense on term loans) / Scheduled principal & interest on term loans (including payments on capital leases)

2.3.5. **Financial Efficiency** shows how efficiently a farm uses financial inputs to produce a financial output. One key aspects of farm efficiency is the amount of net farm income that is generated from a given amount of gross revenue.

**a. Net farm income from operations ratio** = net farm income from operations/gross revenue range.

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## 2.4 SUSTAINABILITY INDICATORS

2.4.1. **Farm Income:** Farm owners have different income requirements and rely to varying degrees on income from their dairy operations. Typically, how well has your farm satisfactorily contributed to your income in each of the last five years (10 pts) (sustainability being “c” or better)?

- a. Unsatisfactory in all years (0 pt)
- b. Unsatisfactory most years (5 pt)
- c. Satisfactory most years (7 pt)
- d. Satisfactorily or better each year (10 pt)

2.4.2. **Current on payments:** Typically, how current is your farm business on making payments according to terms for payments to lenders and suppliers in each of the last five years (10 pts) (sustainability being “b” or better)?

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<sup>10</sup> after Becket et al. 2009, recommended by Bob Parson, UVM  
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- a. Mostly make payments on term (1 pt)
- b. Always make payments on term (5 pt)
- c. Mostly make payments before term is up(7 pt)
- d. Always make payments before terms up (10 pt)

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## TOPIC #3 - REVIEW OF FARM OPERATIONS

Routinely reviewing farm activities, including expenditures and income can help keep your farm on track. This often requires making adjustments in order to achieve your business and personal goals as the realities of your business change. A system for maintaining accurate financial records allows you to carefully manage your finances and reduce stress.

### 3.1 AWARENESS INDICATOR

A routine review of farm operations and financials can help ensure that your plan and management are achieving your goals for your farm. Controlling costs by routinely reviewing expenditures and income is one way to keep your farm on track.

3.2.1. Do you review farm costs, sales, other income, loans, and capital projects on at least a monthly basis (0.8 pt)?<sup>11</sup>

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

### 3.2 PRACTICE INDICATORS

Maintaining a system of accurate farm records is a first step for benchmarking your farm business's progress toward achieving your goals. It also helps to use a routine of reviewing farm records to make proactive adjustments to help keep your farm on track. Maintaining farm records is a first step. Having a routine of review and adjustment for managing financials and production allows you to carefully manage your finances and can help achieve profitability while minimizing stress.

3.2.1. Financial and Production Records: Which of the following farm business records do you keep (3 pts)?

#### Financial Records

- a. Profit and loss statement (0.6 pt)
- b. Accurate and monthly records of cash balance accounts receivables, accounts payable (0.6 pt)

#### Production records

- c. Herd health/herd management (including heifers, calves)(0.2 pt)
- d. Milk production and quality (0.3 pt)
- e. Feed consumption (0.1 pt)
- f. Feed and forage production and quality **OR** I don't produce forage or feed on my farm (0.1 pt)
- g. Production of other agriculture products **OR** I don't produce significant amounts of other products (0.05 pt)
- h. Equipment maintenance (0.05 pt)

<sup>11</sup> Follows Criterion H.71, WWF 2015.

- i. Amounts and costs of inputs (e.g., fertilizer, fuel and electricity, etc.) (0.2 pt)

3.2.2. Financial record keeping system: Which of the following record keeping practices do you apply to your farm business? (1 pt)

- a. Keep business financial records separate from personal financial records (0.6 pt)
- b. Have a certified bookkeeper or accountant (0.1 pt)
- c. Maintain a well-established relationship with a lender by checking periodically OR I never borrow from a lender (0.4 pt)

3.2.3. Benchmarking and Making Changes: Which of the following practices do you apply to achieve your business goals (5 pts)?

Financials and Production (2.3 pts)<sup>12</sup>

- a. Compare monthly profit and loss statements, balance sheets, and cash flow statements to projections or your expectations and adjust expenditures when necessary (1.2 pt)
- b. Review monthly production, production goals and sales, and adjust expenditures and/or herd management when necessary (0.6 pt)
- d. Meet annually with your lender to discuss your farm's balance sheet and financial position OR your dairy doesn't borrow money or have a lender (0.3 pt)
- e. Compare your annual financial performance to industry benchmarks (0.1 pt)

Marketing (1 pt)

- f. Review milk quality data and adjust milk room practices when necessary (0.4 pt)
- g. Periodically review milk sales and quality with buyers or co-op staff (0.3 pt)
- h. Track sales statistics of other agricultural products OR my farm does not sell other agricultural products (0.1 pt)
- i. Review dairy market trends in pricing, production, and market development (0.1 pt)
- j. Review relationships with co-op OR trading partners to ensure I understand the pricing of my milk (1 pt)

Operations (1.3 pt)

- k. Review milk production, herd health, and feed consumption to identify wasteful practices (0.4 pt)
- l. Compare feed and forage production and quality to past years and adjust cropping practices OR I don't produce forage and feed on my farm (0.3 pt)
- m. Review feed/production ratio to identify inefficiencies (0.2 pt)
- n. Review fuel and electricity use to identify wasteful practices (0.2 pt)
- o. Review water use to identify leaks or wasteful practices (0.1 pt)

Employees/family workers (0.4 pt)

- p. Track employee/family worker performance to ensure that they are meeting agreed-to expectations and using their time efficiently OR I don't have family workers or employees (0.4 pt)
- q. have a document verification program for applicants unknown to me OR I don't have employees OR I hire only local labor (0.3 pt)

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### 3.3 PERFORMANCE INDICATORS

<sup>12</sup> Follows Criterion H.71, WWF 2015  
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## MANAGEMENT PERFORMANCE INDICATOR

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2.3.3 Farm Operational Review: Which of the following best described the level of management for the operational review on your dairy?<sup>13</sup>

- a. You and/or your managers track and understand you operations, including farm financials, milk production, herd health, feed/forage production, employee/family worker performance, and other aspects of farm management at a level that has been well above average for the industry in the last five years. Appropriate financial and other records are maintained and reviewed to make it possible to avoid and mitigate risks and adverse dairy financial and operational impacts. The farm also takes proactive action by requiring suppliers and service providers to provide annual statements reflecting costs and amounts of supplies and services used annually and monthly (10 pts).
- b. You and/or your managers track and understand you operations, including farm financials, milk production, herd health, feed/forage production, employee/family worker performance, and other aspects of farm management at a level that has been above average in the last five years. Appropriate financial and other records are maintained and routinely reviewed to make it possible to avoid and mitigate risks and adverse impacts to dairy financials and operations (8 pts).
- c. You and/or your managers track and understand you operations, including farm financials, milk production, herd health, feed/forage production, employee/family worker performance, and other aspects of farm management at a level that has been average for the industry in the last five years. No actual negative impacts to financials and milk production are identified. However, key financial and other records are not always accessible to the owner(s) or managers and/or are only occasionally reviewed though with generally no negative impact to dairy financials and operations (6 pts).
- d. You and/or your managers track and understand you operations, including farm financials, milk production, herd health, feed/forage production, employee/family worker performance, and other aspects of farm management at a level that has been below average in the last five years. Neither risks to financials and milk production nor their potential impacts to the dairy business are regularly reviewed. Adequate reviews of records and operations necessary to mitigate risks and adverse impacts to financials and milk production are only implemented in times of financial and production difficulty (2 pts).
- e. You and/or your managers track and understand you operations, including farm financials, milk production, herd health, feed/forage production, employee/family worker performance, and other aspects of farm management at a level that has been well below average in the last five years. Neither risks to financials and milk production nor their potential impacts to the dairy are regularly reviewed. Adequate reviews of records and operations necessary to mitigate adverse impacts to financials and milk production are never implemented. Adequate reviews of financials and operations necessary to mitigate risks and adverse impacts to financials rarely ever occur (0 pt).

## KEY PERFORMANCE INDICATORS

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3.3.2. Exceeding regulatory standards: One indication of operations being well tracked is that your dairy is able to avoid risk of costly regulatory actions. How well do your farm practices and impacts compare to regulatory standards for the dairy industry (10 pts)?

- a. Mostly Meet (1 pt)
- b. Always Meet (5 pts)
- c. Mostly Exceed (7 pts)

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<sup>13</sup> In part following Criterion H.71, WWF 2015  
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- d. Far Exceed (10 pts)

3.3.3. Reaching financial goals: When farm financials are sufficiently tracked, it makes it easier to achieve your financial goals. While profitability is always desired, sometime your annual financial goals in poor years may be to control losses. Typically, how well does your dairy meet your annual financial goals for in each of the last five years (10 pts)?

- a. Mostly Met (1 pt)
- b. Always Met (5 pt)
- c. Mostly Exceeded (7 pt)
- d. Far Exceeded or I don't have annual financial goals for my farm (10 pt)

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#### 3.4 SUSTAINABILITY INDICATORS

NONE: Farmers don't have obligations for tracking/review of operations that could be crafted into a context-based indicator.

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# PEOPLE

## TOPIC #4 - FARM FAMILY WELL-BEING

Making a comfortable living, meeting basic needs, and seeing life improvement is essential for making a farm sustainable. Quality of life includes economic standard of living, as well as job satisfaction; personal health; time for family, friends, and leisure; and achieving life goals. Good planning for succession can also contribute to the well-being of your family, providing retirement for the older generation while providing a clear path forward for the next generation of farmers.

### 4.1: AWARENESS INDICATOR

For farmers, making a comfortable living is essential for making a farm sustainable. This allows farmers and their families to have a reasonable economic standard of living and provide for their families.

4.1.1 In the last five years or as long as you have owned your farm (whichever is shorter), are you able to make a comfortable living for you and your family each year (0.8 pt)?

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

### 4.2: PRACTICE INDICATORS

Farmer and farm family well-being require a routine of practices to ensure good work/life balance and farm sustainability.

4.2.1 Business Practices and Work/Life Balance: Which of the following practices do you apply to achieve your business goals and help achieve life-work balance (8 pts)?

- a. Plan for owner's draw that provides sufficient income to meet your needs and minimize taxes (4 pt)
- b. Hire employees or contractors to compliment your strengths and weakness and achieve work/life balance (0.8 pt)
- c. Spend quality leisure time each day with yourself, spouse, family, and/or friends (0.8 pt)
- d. Take vacation to get away from the farm for at least two nights each year by yourself or with your spouse or partner, and/or family (0.8 pt)
- e. Minimize key health, safety, and lifestyle risk impacts associated with farming on you and your family (0.8 pt)
- f. Home maintenance for the house that provides a home for you and your family (0.8 pt)

4.2.2 Vacation: Which of the following practices do you apply for making vacation time away from the farm possible (1 pt)?

- a. Network of replacement for milkers (0.2 pt)
- b. Saving money (0.2 pt)
- c. Annual cycle of drying cows off (0.2 pt)
- d. Other (0.2 pt) (list): \_\_\_\_\_



e. Other (0.2 pt) (list): \_\_\_\_\_

4.2.3 Preparing the next generation: It is hard work to share your knowledge of dairy farming and help the next generation be prepared to take over the farm. However, this is an essential step for succession. Which of the following practices have you applied to make it possible for the next generation in your extended family to continue dairy farming (1 pt)?

Succession planning (0.7 pt)<sup>14</sup>

- a. Have obtained input from the next generation about succession planning and my estate (0.2 pt)
- b. Have a written successional plan and a will or legal trust (0.2 pt)
- c. Have explained succession plans and inheritance clearly to next generation (0.2 pt)
- d. Shared your social and business network with the next generation (0.1 pt)

Provided on-farm and off-farm training opportunities to the next generation on (0.3 pt):

- e. Farm business management (0.1 pt)
- f. Cropping, pasture, and forage management (0.1 pt)
- g. Milk room and herd management (0.1 pt)

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## 4.3 PERFORMANCE INDICATORS

### KEY MANAGEMENT INDICATOR

4.3.1 Personal and Farm family well-being and health: Which of the following best described the level of management for personal and farm family well-being and health on your farm (select only one) (10 pts)?

- Risks and potential impacts to personal and family health and life are regularly reviewed. Appropriate measures to prevent and mitigate adverse impacts (e.g., personal time, safety actions, vacation, family time) to personal and family life are implemented. The farmer and his/her family also takes proactive action to improve personal and family life for the farm family (e.g., planning for family time, events and activities, attending social events) (10 pts).
- Risks and potential impacts to personal and family health and life are regularly reviewed. Appropriate measures to prevent and mitigate adverse impacts (e.g., personal time, safety actions, vacation, family time) to personal and family life are implemented (8 pts).
- Risks and potential impacts to personal and family health and life are regularly reviewed. No actual negative impacts to personal and family life are identified, but only minimum measures are implemented to prevent adverse impacts to personal and family life (6 pts).
- Neither risks nor potential impacts to personal and family health and life are regularly reviewed. Only minimum measures necessary to mitigate adverse impacts to personal and family life are implemented in times of personal and/or family crisis (2 pts).
- Neither risks nor potential impacts to personal and family health and life are regularly reviewed. No measures to mitigate adverse impacts to personal and family life are implemented in times or personal and/or family crisis (0 pt).

### KEY PERFORMANCE INDICATORS

Your sense of personal well-being can be improved through meaningful family, work, community, and spiritual life (Indicators 4.3.2 to 4.3.6).

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<sup>14</sup> 4.3.5b is the same as Farm Indicator 3.5: Successional Transfer (Innovation Center for U.S. Dairy 2014)

- 4.3.2 Family: I am able to balance how much I work with spending meaningful time with myself, my spouse and/or family.
- a. disagree (0 pt)
  - b. you neither agree nor disagree (0.75 pt)
  - c. agree (1.5 pt)
  - d. strongly agree (2 pt)
- 4.3.3 Work Satisfaction: Dairy farming provides me with an opportunity to work towards my full potential and a work environment that I appreciate.
- a. disagree (0 pt)
  - b. you neither agree nor disagree (0.75 pt)
  - c. agree (1.5 pt)
  - d. strongly agree (2 pt)
- 4.3.4 Meaningful Work: Through dairy farming I am able to make a meaningful contribution to my family, community, and the well-being of others.
- a. disagree (0 pt)
  - b. you neither agree nor disagree (0.75 pt)
  - c. agree (2 pt)
  - d. strongly agree (2 pt)
- 4.3.5 Community Participation: I am able to meaningfully participate in my community and I like where I live.
- a. disagree (0 pt)
  - b. you neither agree nor disagree (0.75 pt)
  - c. agree (1.5 pt)
  - d. strongly agree (2 pt)
- 4.3.6 Meaningful and/or Spiritual Life: I am able to participate in meaningful or spiritual events and/or in my community and/or have adequate time for personal reflection.
- a. disagree (0 pt)
  - b. you neither agree nor disagree (0.75 pt)
  - c. agree (1.5 pt)
  - d. strongly agree (2 pt)
- 4.3.7 Preparing the next generation Score:  $[(\text{Sum of points from Indicators 4.2.3}) \times 100]$ . Although this is a performance score, farmers recognize that the score will vary with the age of a farmer. Young farmers may only have a legal will or trust document and score low whereas farmers nearing retirement may have completely prepared for succession and score high.

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#### 4.4 SUSTAINABILITY INDICATOR

Farmers have an obligation to maintain the well-being of themselves and their families. The well-being of the farm family is essential to the sustainability of the farm operations.

- 4.4.1 Farmer well-being: Your well-being is essential for living a meaningful life and being able to support and encourage your family and friends. Your well-being score is one measure of your well-being. A farm

operation is considered sustainable when the Well-being Scores are  $\geq 1$  (agree or better) for questions 4.3.1 to 4.3.5.<sup>15</sup>

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<sup>15</sup> Judge et al. 2010.  
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## TOPIC #5 – CONSUMER WELL-BEING

Milk processors, retailers, and consumers want assurance that the food they receive is safe and wholesome. To provide safe milk, dairy farmers adhere to strict food safety regulations, maintaining clean and safe facilities. This includes maintaining a safe environment, cow health, and sanitary milking.

### 5.1 AWARENESS INDICATOR

Safe, nutritious milk is one of the greatest benefits provided by dairy farmers. Farms that follow milk quality and sanitation requirements have access to premium markets, are more productive, and enhance the dairy industry's reputation. When farmer fail to do so, he or she risks undermining the reputation of the industry and his/her market for dairy products.

5.1.1 Do you currently meet or exceed state and federal requirements concerning milk quality and farm sanitation on your dairy operation (0.8 pt)?

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

### 5.2 PRACTICE INDICATORS<sup>16</sup>

Assuring food safety at the beginning of dairy supply chain is key to the dairy farmers, the industry, and its millions of consumers. Farms that routinely apply milk quality and sanitation practices produce quality milk, providing access to premium markets and enhancing their reputation. Key considerations include employee training, cow health management and milk sanitation.

5.2.1 Food Safety and Employees: To achieve milk quality and sanitation goals, employees/family workers must understand and be trained on proper procedures. Which of the following food safety and employee BMPs do you use in supervising employees/family workers involved with handling milk (2.1 pts)?

- a. Train new employees/family workers how to implement your milk sanitation practices (e.g., milking and cleaning procedures) (1 pt)
- b. Implement regular employee/family training of proper drug use to ensure the marketing of unadulterated milk and meat and avoid costly potential contamination.
- c. Provide instructions to employees in their primary language OR I don't have employees (0.5 pt)
- d. Regularly review your food safety and milk sanitation practices with employees/family workers (0.4 pt)
- e. Store and limit employee access to all medicines, pesticides, herbicides and other potentially hazardous materials to minimize the risk of milk contamination (0.2 pt)

<sup>16</sup> 6.2.1 and 6.2.2 align with NMPF (2014) and Standards MP.v and MP.w in the Assured Food Standard (2014).

6.2.3, 6.2.4, 6.2.5 align with Dairy Farmers of Canada (2010).

5.2.2 Drug Residue Prevention: It takes a coordinated effort between you, your employees/family workers, and your veterinarian to prevent drug residues in your farm products<sup>17</sup>. Cows with drug residues in their milk must not be shipped for human use to ensure safe food. Which of the following residue prevention BMPs do you always apply (3 pts)?

- a. Establish a valid veterinary/client/patient relationship (VCPR) and regularly consult with a veterinarian to understand prohibitions and withdrawal times for drugs (0.6 pt)<sup>18</sup>
- b. Use only prescription (Rx) drugs or FDA-approved over-the-counter (OTC) drugs with veterinarian's guidance (0.6 pt)
- c. Administer all drugs properly (including withdrawal times) and identify all treated animals (1 pt)
- d. Maintain and use proper treatment records (treatment date, animal identification, dosage, route of administration, withdrawal time for milk/meat, person who administered the drug, drug used, and length of therapy) on all treated animals (0.4 pt)
- e. Use drug residue screening tests on dry-cow-treated cows that freshen early and newly purchased animals (0.4 pt)

#### COW HEALTH (2.7 PTS)

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5.2.3 Milking procedures: Milking is a key point on a farm where a farmer can prevent milk from contamination that can enter the human food chain. Have you established and implemented standard procedures for managing the following (1.6 pt)?

- a. Preparing cows for milking, including udder care (0.2 pt)
- b. Milking cows (0.2 pt)
- c. Cows after milking, including udder after care (0.2 pt)
- d. Tracking treated lactating cows (including marking treated cows) and other measures to minimize the risk of shipping abnormal milk or milk from treated cows (0.5 pt)
- e. Milking staff are aware of relevant procedures that prevent contaminated milk from entering the milk storage tank (0.5 pt).

5.2.4 Managing Cow Health: Which of the following cow health BMPs do you apply on your farm (1.1 pt)?

- a. Consult annually with a veterinarian to clearly understand legal prohibitions and withdrawal times for drugs (including those used off label) and other animal treatments (0.8 pt)
- b. A system, such as hospital pens, to separate cattle needing special treatment (0.3 pt)

#### FACILITY AND EQUIPMENT SANITATION (2.2 PTS)

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Good sanitation helps reduce disease, the need for antibacterial agents and the risk of contamination from chemicals and livestock medications.

5.2.5 Facility and Equipment Sanitation: Which of the following sanitation BMPs do you follow in your milking system (2 pts)?

- a. Use approved cleaning products for cleaning milking equipment and the milk room (0.5 pt)<sup>19</sup>
- b. Record and check bulk tank temperature after every milking (0.5 pt)
- c. Inspect the cleanliness of milking equipment (e.g. receiver jar and bulk tank) at least monthly (0.4 pt)
- d. Have established and implemented a standard procedure for cleaning the milking system (0.2 pt)

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<sup>17</sup> Economou and Gousia 2015.

<sup>18</sup> Farm Indicator 1.2: Veterinary Care (Innovation Center for U.S. Dairy 2014)

<sup>19</sup> Standard MP.b (Assured Food Standard 2014)

- e. Annually test the water used for cleaning the milking system for the microorganisms (0.2 pt)
- f. Have removed all mercury thermometers and vacuum columns from the milk house (0.2 pt)
- g. The dairy and milk storage access points are kept secure when unattended (0.2 pt)<sup>20</sup>
- h. Apply vermin control to milk room, milking parlor, and feed storage to prevent contamination by mice, birds, and/or insects (0.2 pt)<sup>21</sup>

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## 5.3 PERFORMANCE INDICATORS

### KEY MANAGEMENT INDICATOR

8.3.1 **Food safety and milk sanitation:** Which of the following best described the level of food safety and milk sanitation management on your dairy?<sup>22</sup>

- Risks and potential impacts to food safety and milk sanitation are regularly monitored including somatic cell counts. Appropriate measures to prevent and mitigate adverse impacts are implemented. The dairy also takes proactive action to improve food safety and milk sanitation (5 pt).
- Risks and potential impacts to food safety and milk sanitation are regularly monitored including somatic cell counts. Appropriate measures to prevent and mitigate adverse impacts are implemented (4 pts).
- Risks and potential impacts to food safety and milk sanitation are regularly monitored including somatic cell counts. No actual damage is identified, but only minimum measures necessary to prevent adverse impacts to food safety and milk sanitation are implemented (3 pts).
- Neither risks nor potential impacts to food safety and milk sanitation are regularly monitored. Somatic cell counts are periodically monitored. Only minimum measures necessary to mitigate adverse impacts to food safety and milk sanitation are implemented in response to actual damage (1 pt).
- Neither risks nor potential impacts to food safety and milk sanitation are regularly monitored. There is not enough time to review somatic cell counts. No measures to mitigate adverse impacts to food safety and milk sanitation are implemented (0 pt).

### KEY PERFORMANCE INDICATORS

8.3.2 **Food production:** One of the greatest benefit to society of most dairy farmers is the milk produced as a food for human consumption. Dairy products have a high nutrient density and contain elements vital to human nutrition. A simple measure of this is annual milk production and annual milk production per cow. Annual milk production per cow provides a measure of milk production efficiency.

**a. Annual Milk Production:** Annual Milk Production is the total milk produced (CWT).<sup>23</sup>

**b. Average Annual Milk Production per Cow:** Annual Milk production per cow (CWT/cow) is the total milk produced (CWT) divided by the average number of lactating cows in the herd.

8.3.3 **Milk Sanitation:** Milk sanitation is essential for ensuring that the human food chain is safe and for milk to contribute to human nutrition. Poor milk sanitation undermines the farmer's ability to sell milk and generate revenue, the reputation of milk as a safe food product, and the reputation of the dairy industry as good stewards of consumer safety. While sanitation inspections and milk testing may seem onerous, they help ensure markets for your milk and the reputation of the dairy industry and milk as a safe and healthy food.

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<sup>20</sup> Standard MP.e, MP.i, MP.i1, MP.l, MP.n, MP.o (Assured Food Standard 2014)

<sup>21</sup> Standards VC.a Key and VC.a1 (assure, d Food Standards 2014)

<sup>22</sup> Based in part on the NMPF (2014), Dairy Stewardship Alliance (2005), and Fontes et al. (2014)

<sup>23</sup> Utz Indicator I.A.3 (yields)

**a. Passing Sanitation Inspections:** Percent of state inspections passed in the last five years due to major violations. Auto-populated by co-op.

**b. Milk Quality:** Percent of loads of milk accepted in the last 12 months. Auto-populated by co-op.

8.3.4 **Safe Dairy Products:** All food products can pose risk to human health. If you are conducting direct sales of dairy products, you should communicate their safe use, including required labels for sale of raw milk products.

**a. Safe Dairy Products:** If you are conducting direct sales of dairy products, do you communicating safe use of your products (Yes/No)?

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## 5.4 SUSTAINABILITY INDICATORS

Dairy farmers are obligated to provide sanitary and safe milk to their customer and consumers.

5.4.1 **Milk Sanitation:** Milk sanitation is essential for ensuring that the human food chain is safe and for milk to contribute to human nutrition. Poor milk sanitation undermines the farmer's ability to sell milk and generate revenue, the reputation of milk as a safe food product, and the reputation of the dairy industry as good stewards of consumer safety. While sanitation inspections and milk testing may seem onerous, they help ensure markets for your milk and the reputation of the dairy industry and milk as a safe and healthy food.

**a. Passing Sanitation Inspections:** Percent of state inspections passed in last five years due to major violations (if <100% **AND** corrective action not taken then not sustainable). Auto-populated by co-op.

**b. Milk Quality:** Percent of loads of milk accepted in the last 12 months (if <100% **AND** corrective action(s) not undertaken then not sustainable). Auto-populated by co-op.

5.4.2 **Safe Dairy Products:** All food products can pose risk to human health. If you are conducting direct sales of dairy products, you should communicate their safe use, including required labels for sale of dairy products.

**a. Safe Dairy Products:** If you are conducting direct sales of dairy products, do you communicate safe use of your products ("d" is considered sustainable) (10 pts)?

- I never conduct direct sales of dairy products (skip this section).
  - a. Never (0 pt)
  - b. Less than mostly (2 pt)
  - c. Mostly (8 pt)
  - d. Always (10 pt)

Employee and worker supervision is a key contributor to farm profitability<sup>24</sup>. Workers can cost one-fifth of a worker's salary to replace<sup>25</sup>. Quality leadership can help create a safe workplace and reduced injuries and may offer a competitive advantage<sup>26</sup>. Engaged employees care about their jobs, work more efficiently, improve productivity and make fewer mistakes<sup>27</sup>. This can improve profitability at the dairy.

### 6.1. AWARENESS INDICATOR

Productive employees/family workers are key to any business. It is important to discuss and learn about safe practices to foster a culture of safety. Accident prevention also saves farmers time and money.

6.1.1 Do you, employee(s), and/or a consultant review work safety and/or safety training with farm workers on about a monthly basis (0.8 pt)?

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

### 6.2 PRACTICE INDICATORS

Key practices for supervising employees include having good organization, and addressing employee relations, working conditions, and compensation and benefits<sup>28</sup>.

#### EMPLOYEE MANAGEMENT (3 PTS)

6.2.1. Farm Organization: Good organization can create a well-defined workplace wherein employees and family workers understand their responsibilities and performance. This contributes to their satisfaction, engagement, and productivity. Which of the following information do you keep regarding employees and their supervision (1 pt)?

- a. Only me and 1 family members run my farm (skip this question)(1 pt)
- OR**
- b. An organizational chart that identifies who oversees each employees/family worker (0.17 pt)
  - c. A list of employees/family workers and their job titles (0.15 pt)
  - d. A list of key job titles and 1 to 5 key skills and responsibilities (0.17 pt)
  - e. Description of compensation and benefits package for each job title (0.17 pt)
  - f. A performance review system that is understood by employees (0.17 pt)

<sup>24</sup> Oliver and Erickson 2008

<sup>25</sup> Development Dimensions International (2015) and Center for American Progress (2015).

<sup>26</sup> Hagevoort et al. 2013.

<sup>27</sup> Society for Human Resource Management 2012.

<sup>28</sup> Rosenberg et al. 2002.



- g. A Code of Conduct (a document that establishes behavioral expectations for the organization and employees) (0.17 pt)

6.2.2. Employee relations: A good supervisor shows strong leadership, holds positive standards, and is personally interested in his/her employees. Recognition and achievement are also key factors for employees/family worker satisfaction, lower accident rates, greater productivity, and lower turnover. Which of the following employee relations BMPs are applied on your farm (2 pts)<sup>29</sup>?

- a. Communicate management goals, objectives, decisions, and work assignments to employees/family workers (0.4 pts)
- b. Coach and develop employees/family workers to maximize their potential (0.3 pts)
- c. Provide constructive feedback to employees/family workers and encourage their feedback (0.3 pts)
- d. Build relationships with employees/family workers (0.2 pts)
- e. Provide for employee/family worker recognition and accountability for behaviors and performance (0.3 pts)
- f. Foster skills of employees/family workers through training and/or coaching (0.2 pts)
- g. Serve as a role model to employees/family workers (0.3 pts)

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#### WORKING CONDITIONS (4 PTS)<sup>30</sup>

Safe working conditions can help avoid down time and short-staffing due to injuries and reduce worker compensation insurance rates. Providing sanitary conditions adds to the comfort of employees/family workers. Poor working conditions can lead to employee dissatisfaction and undermine employee productivity.

6.2.3. Employees/Family Worker Safety: Creating a culture of safety can minimize injuries and help establish efficient and productive routines. Which of the following worker safety BMPs do you provide apply on your farm (2 pts)?<sup>31</sup>

- a. Post safety documentation and/or signage on equipment in the languages of workers (0.3 pt)
- b. Identify safety risks and provide safety and first aid training for yourself and employees/family workers for managing farm machinery, chemicals, electricity, animal medications, fertilizers, fuels, lubricants, fire, and waste (0.5 pt)<sup>32</sup>
- c. Provide safety equipment where necessary, including first aid supplies (0.4 pt)
- d. Review written safety documentation of safety procedures and training **AND** review and distribute to employees/family workers (0.4 pt)
- e. Maintain a list potentially dangerous/toxic chemicals and their material safety data sheet (MSDS) (0.4 pt)

6.2.4. Sanitation Facilities: Sanitation facilities contribute to employees'/family workers' comfort and health. Which of the following sanitation facilities do you provide? (1.5 pt)

- a. Bathroom (0.4 pt)
- b. Washroom with supplies (0.4 pt)
- c. Shower/bath (0.4 pt)
- d. Laundry (0.3 pt)

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<sup>29</sup> Follows Rosenberg et al. 2002.

<sup>30</sup> Aligns with requirements in Section 8.3 Social and Human Capital in Unilever Sustainable Agriculture Code.

<sup>31</sup> Follows WWF (2015) - C. Worker's Rights Indicator 26

<sup>32</sup> Follows WWF (2015) - C. Worker's Rights Indicator 25

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## EMPLOYEE COMPENSATION AND BENEFITS (3 PTS)

Well-compensated employees/family workers feel valued while below-average employee compensation can contribute to dissatisfaction, lower productivity, and turnover.

6.2.5. Wages: What do you typically pay employees? (1.5 pts)

- a. State-law minimum wage, no benefits (0.2 pt)
- b. At or slightly above state-law minimum wage, scheduled increases, with limited benefits (0.8 pt)
- c. Benefits package valued at >150% of state-law minimum wage and scheduled increases (1.5 pt)

6.2.6. Health care: Do you make a health care plan available to employees/family workers? (0.8 pt)

- a. No (0 pt)
- b. Yes, but with no employer contribution (0.2 pt)
- c. Yes, with employer contribution (0.8 pt)?

6.2.7. Additional benefits: What benefits do employees/family workers receive (0.7 pt)?

- a. Housing with adequate privacy (0.17 pt)
- b. Paid vacation (0.05 pt)
- c. Overtime pay (0.05 pt)
- d. 401k [or comparable retirement benefit] (0.05 pt)
- e. Daily meals (0.17 pt)
- f. Pasture for the employees' livestock (0.03 pt)
- g. Use of farm vehicles and tools (0.03 pt)
- h. Garden space (0.03 pt)
- i. On-farm-produced products (0.03 pt)
- j. Disability Coverage (0.03 pt)
- k. Life Insurance (0.03 pt)
- l. Auto allowance
- m. Travel allowance
- n. Maternity/Paternity Leave (0.03 pt)

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## 6.3 PERFORMANCE INDICATORS

### KEY MANAGEMENT INDICATORS

6.3.1 Health and safety training: Which of the following best described the health and safety training management for family workers and employees on your farm (select one) (10 pts)?<sup>33</sup>

- a. Health and safety training is provided and duties and lines of responsibility for health and safety are defined. Family workers and/or employees are involved in the design, development and review of health and safety programs. The level of incidents is measured and reduction targets are set.
- b. Health and safety training is provided and duties and lines of responsibility for health and safety are defined. In addition, family workers and/or employees are involved in the design, development and review of health and safety programs.
- c. Health and safety training is provided and duties and lines of responsibility for health and safety are defined.
- d. No health and safety training is provided, or no duties and lines of responsibility for health and safety are defined.

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<sup>33</sup> Based on Fontes 2014.

- e. No health and safety training is provided and no duties and lines of responsibility for health and safety are defined.

6.3.2 **Employee relations:** A good supervisor shows strong leadership, holds positive standards, and is personally interested in his/her employees. Recognition and achievement are also key factors for employees/family worker satisfaction, lower accident rates, greater productivity, and lower turnover. Which of the following best described the management of family workers and employee relations on your farm (select one) (10 pts)?

- a. Manager(s) regularly reviews goals, objectives, decisions, and work assignments with family workers and employees. They often provide constructive feedback and provide accountability for behaviors and performance to help family workers and employees to develop new skills through training or with coaching and achieve their potential.
- b. Manager(s) regularly reviews goals, objectives, decisions, and work assignments with family workers and employees. They periodically provide constructive feedback and provide accountability for behaviors and performance and to help family workers and employees to develop new skills through training or with coaching and achieve their potential.
- c. Manager(s) occasionally reviews goals, objectives, decisions, and work assignments with family workers and employees. They sporadically provide feedback and provide accountability for behaviors and performance but rarely help family workers and employees develop new skills through training or with coaching and achieve their potential.
- d. Manager(s) rarely review goals, objectives, decisions, and work assignments with family workers and employees. On an ad hoc basis, they provide feedback and provide accountability for behaviors and performance but rarely help family workers and employees develop new skills through training or with coaching and achieve their potential.
- e. Manager(s) rarely review goals and objectives with family workers and employees or provide constructive feedback or training opportunities.

#### KEY PERFORMANCE INDICATORS:

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6.3.3 **Employment:** Farms contribute to the economy of rural communities by providing employment and employee benefits.

a. Number of Employees: How many full time employees and family workers did your farm employ in the last year? How many part-time employees and family workers did your business employ in the last year?<sup>34</sup>

b. Number of Contractors: How many full-time equivalent contractors (people or entities who provide services not under the direct control of the dairy farm<sup>35</sup>) did your farm business hire in the last year?

c. Farm Employee Benefits: How many of indirect and non-monetary benefits were received by employees (tallied from 7.2.12) in the past five years?<sup>36</sup>

d. Wage of lowest paid farm worker: What was the wage (including non-monetary benefits) of the lowest paid farm worker (e.g., field, calf feeding, milk room) (\$/hour)?

6.3.4 **Safety:** DART (Days Away from work, job Restrictions, and/or job Transfers) rate is a measure of workplace injuries severe enough to warrant days away from work, job restrictions, and/or job transfers.

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<sup>34</sup> Farm Indicator 2.1: Employment Opportunities (Innovation Center for U.S. Dairy 2014) and Similar to Indicator 3.3 Stakeholder group: 'local communities' - Employment, Handbook for Social Impacts Assessment (Fontes et al. 2014).

<sup>35</sup> IRS 2015

<sup>36</sup> Farm Indicator 2.2: Farm Employee Benefits (Innovation Center for U.S. Dairy 2014)

c. DART: (Total number of injuries and illnesses with Days Away From Work + total number of injuries and illnesses resulting in days with Restricted Work/ Total number of hours worked by all employees, including management, temporary, and leased workers) X 200,000

6.3.5 Employee Retention: Retaining good employees can reduce costs of employee supervision and minimize costs of employee recruitment. Employee retention is the measure of your ability to retain employee, in percentage of our total number of employees/family workers. Associate departures are considered, including both voluntary and non-voluntary departures.

d. Employee Retention Rate: What percentage of employees remained on staff in the last year?<sup>37</sup>

6.3.6 Employee Training: On the job training helps employees/family workers develop job skills and builds up personal knowledge in local communities. Safety training is time spent teaching employees practices and procedures are intended to reduce risk of personal injury.

a. Job Training: How many hours a year are spent training you, family workers, or employees on your farm for new tasks or technologies (e.g., use of new equipment, techniques, practices, skills)?<sup>38</sup>

b. Safety Training: What percent of family workers or employees (including yourself) on your farm have participated in health and safety training programs in the last year?<sup>39</sup>

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## 6.4 SUSTAINABILITY INDICATORS

6.4.1 Good wage: A good wage is one that is sufficient to support an employee and his/her family and avoid the need for government subsidies to support your employees.

a. **Good wage**: Does your wages (including indirect, non-monetary benefits) for your lowest paid farm worker (e.g., field work, calf feedings, milk room) meet or exceed a good wage levels for your state?<sup>40</sup> Use either the MIT Livable Wage Calculator<sup>41</sup> or 150% of state minimum wage to determine the threshold for a good wage. You should make sure that you include indirect, non-monetary benefits in your calculation.

6.4.2 Employee safety: Safety is essential in order to maintain a skilled labor force. A three year running average DART should be less than or equal to 1 indicating that safety is constant or improving and that workman's compensation insurance costs are not increasing rapidly.

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<sup>37</sup> Similar to Farm Indicator 2.3: Employee Turnover (Innovation Center for U.S. Dairy 2014) and to Indicator 3.1 Workers – Job satisfaction and engagement (turnover rate), Handbook for Social Impacts Assessment (Fontes et al. 2014).

Formula used: [(Number of associates at the beginning of the reporting period + External Hires during the reporting period) – total departures] / [Number of associates at the beginning of the reporting period + External Hires during the reporting period] x 100

To calculate the employee retention rate, start with the total number of employees on staff at the end of a period -- monthly, quarterly or annually. For example, if you have 200 employees at the end of a quarter, and 25 of those employees left the business during the same quarter, subtract 25 from 200. Divide the result by the total number of employees, and multiply the answer by 100 to get the retention rate. In the example, the employee retention rate is 87.5 percent.

<sup>38</sup> Same as Indicator 3.1 Workers – Training and education, Fontes et al. 2014.

<sup>39</sup> Part of Farm Indicator 2.4: Employee Safety Training (Innovation Center for U.S. Dairy 2014) and is similar to Indicator 3.1 Workers - Health and safety Indicator and Workers – Training and Education, Handbook for Social Impacts Assessment (Fontes et al. 2014). 2 All workers are trained periodically/annually, 1 >75% workers are trained occasionally, 0 Between 50% and 75% of workers are trained occasionally, -1 <50% of workers are trained occasionally, -2 Workers do not receive training

<sup>40</sup> Similar to Indicator 3.1 Workers – Wages (Living Wage), Fontes et al. 2014.

<sup>41</sup>

[http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CB8QFjAA&url=http%3A%2F%2Flivingwage.mit.edu%2F&ei=6GCFVYS1FYHb-QGq1\\_4Ag&usg=AFQjCNFY6XqEYTzSvBOXJ5br6sifJt\\_tqw&bvm=bv.96952980,d.cWw](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CB8QFjAA&url=http%3A%2F%2Flivingwage.mit.edu%2F&ei=6GCFVYS1FYHb-QGq1_4Ag&usg=AFQjCNFY6XqEYTzSvBOXJ5br6sifJt_tqw&bvm=bv.96952980,d.cWw)

a. **DART Average:** (current year DART) / (3 year average DART)<sup>42</sup>

6.4.3. Legal obligations: Complying with legal obligation toward employees is required in order to do the right thing and avoid the burden of fines and law suits.

**a. Compliance with labor laws:** When a farm has had no regulatory actions in the last year OR is compliant with corrective action plans then the dairy is considered sustainable. Which of the following best describes the compliance of your dairy farm with local, state, and federal regulations concerning regarding child labor, involuntary labor, discrimination, and wages/compensation<sup>43</sup> ("b" or better is sustainable)(10 pts)?

- a. Mostly doesn't not meet regulatory compliance
- b. Mostly compliant with OR mostly compliant and undergoing corrective action response (1 pt)
- c. Always compliant with OR currently compliant with and have fulfilled corrective action plans for compliance failures (5 pts)
- d. Always compliant with and Mostly Exceed (7 pts)
- e. Always compliant with and Far Exceed (10 pts)

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<sup>42</sup> Farm Indicator 2.5: Days of Restricted Work Activity or Job Transfer (Innovation Center for U.S. Dairy 2014). National Council on Compensation Insurance: score >1 means paying higher premiums, =<1 paying less than average premiums and is sustainable.

<sup>43</sup> Follows WWF (2015) - C. Worker's Rights Indicators 22, 23, and 28.

## TOPIC #7 - LOCAL COMMUNITY WELL-BEING

Having good relationships with neighbors and your local community can foster community support for your farm<sup>44</sup>. Local support for agriculture can be enhanced through community outreach and when an operation visually reminds a community of its agricultural heritage. Managing your safety risks can help you maintain your reputation and avoid farm-related injuries and costly lawsuits.

### 7.1 AWARENESS INDICATOR

7.1.1 Do you educate the public about agriculture (for example, provide field tours, talk to neighbors, etc.) or volunteer in your local community (for example, with charitable organizations or in an elected position, etc.) each year (0.8 pt)?

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

### 7.2 PRACTICE INDICATORS<sup>45</sup>

7.2.1. Education and Outreach: Education and outreach can help promote dairy agriculture in your local community and connect people, especially children, to how their food is produced. Which of the following types of community outreach did you participate in in the last calendar year (check all that apply, if “Other”, list)?(2 pts)

- a. None (0 pt)
- b. Volunteering with agricultural conservation organizations (e.g., 4-H, Grange, co-ops) (0.3 pt)
- c. Volunteering for positions in local government (e.g., planning commissions) (0.3 pt)
- d. Provide educational farm tours (0.35 pt)
- e. Direct market agricultural products locally (0.25 pt)
- f. Permit at least some kinds of recreational access (0.25 pt)
- g. Routinely talk to neighbors about your farm (0.25 pt)
- h. Donate money or materials to local charities or non-profit organizations (0.2 pt)<sup>46</sup>
- i. Other: \_\_\_\_\_ (0.1 pt)

7.2.2. Promotion of Agricultural Heritage: Maintaining the appearance of your farm operations can make farming visually attractive and remind local communities of their agricultural heritage and identity. Did you add to the scenic appeal of your farm by employing any of the following practices in the last calendar year (check all that apply, if “Other” list)?(2 pts)

- a. None (0 pt)
- b. Maintain farm buildings >60 years old that are visual reminders of local agricultural heritage (0.2 pt)
- c. Cropping in visible areas (0.2 pt)

<sup>44</sup> Hadley et al. 2002.

<sup>45</sup> 8.2.1, 8.2.2, and 8.2.3 follow Indicator 3.3 Stakeholder group: ‘local communities’ - Community engagement, Handbook for Social Impacts Assessment (Fontes et al. 2014).

<sup>46</sup> Austin Green Business Leaders Program (2015)

- d. Visible farm sign (0.2 pt)
- e. Mowing roadsides (0.2 pt)
- f. Landscaped farm entrance (0.2 pt)
- g. Trash removal (0.2 pt)
- h. Newly sided or painted building (visible from road) in the last 10 years (0.2 pt)
- i. Pasturing along roadsides (0.2 pt)
- j. Other: \_\_\_\_\_ (0.2 pt)
- k. Other: \_\_\_\_\_ (0.2 pt)

7.2.3. Neighborliness: Maintaining good relations with neighbors can help avoid problematic conflicts, educate neighbors, and cultivate local supporters for your farm and dairy agriculture. What practices and strategies do you employ to encourage good relations with neighbors (check all that apply, if “Other”, list) (2 pts)?<sup>47</sup>

- a. None (0 pt)
- b. Practices to reduce the odors associated with manure spreading (0.3 pt)
- c. Practices to minimize the effect of fly populations (0.3 pt)
- d. Notify abutting neighbors when moving/applying manure (0.4 pt)
- f. Provide your abutting neighbor with your contact information and get their contact information (0.5 pt)<sup>48</sup>
- g. Provide small amounts of manure to your abutting neighbors (0.1 pt)
- h. Locate new farm buildings away from property lines (0.4 pt)
- i. Talk to abutting neighbors about your farm (0.6 pt)<sup>49</sup>
- j. Mail a newsletter one or more times a year to abutting and nearby neighbors
- k. Other: \_\_\_\_\_ (0.4 pt)

7.2.4. Community Health and Safety: Most farmers are careful stewards and avoid posing health risks to their local communities. Health risks can include impacts to ground and surface water, farm chemicals, loose livestock, farm equipment on public roads, and diseases that spread to humans. Which of the following practices do you apply to protect the health of local communities (4 pts)?<sup>50</sup>

- a. Farm liability insurance sufficient to adequately compensate for losses and damages (0.5 pt)

Environmental Health

- b. Water quality BMPs including riparian buffers and implementation of nutrient management plans (0.3 pt)
- c. Use of dust and emission’s BMPs to control dust and emissions from livestock operations (0.3 pt)
- d. Pesticide BMPs to avoid pesticide drift **OR** pesticides are not applied near property boundaries (0.3 pt)

Farm Chemicals

- d. Proper disposal of leftover farm chemicals (0.3 pt)
- e. A hazardous chemical spill plan and spill containment kit (0.3 pt)
- f. Contact information for reporting chemicals spills that must be reported to state agencies (0.3 pt)

Loose Livestock

- g. Regularly inspect and maintain fences to ensure animals don’t escape (0.3 pt)

<sup>47</sup> WWF (2015) - B. COMMUNITY RELATIONS, Indicator 12 and 13.

<sup>48</sup> WWF (2015) - B. COMMUNITY RELATIONS, Indicator 11.

<sup>49</sup> WWF (2015) - B. COMMUNITY RELATIONS, Indicator 11.

<sup>50</sup> WWF (2015) - B. COMMUNITY RELATIONS, Indicator 12 and 13.

- h. Contact information for neighbors and getting assistance (0.3 pt)

#### Use of Public Roads

- i. Good lighting and safe motor vehicle (SMV) signage on equipment and vehicles (0.3 pt)
- j. Avoid moving equipment at night (0.3 pt)
- k. Obey all traffic laws and signs and follow other road BMPs (0.4 pt)

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### 7.3 PERFORMANCE INDICATORS<sup>51</sup>

#### KEY MANAGEMENT INDICATORS

7.3.1 Community health and safety: Which of the following best described the level of community health and safety management on your farm for your local community (select one) (10 pts)?<sup>52</sup>

- a. Risks and impacts on community health and safety are regularly monitored. Appropriate measures to prevent and mitigate adverse impact are implemented. The farm owners also take proactive action to improve community health and safety (10 pts).
- b. Risks and impacts on community health and safety are regularly monitored. Appropriate measures to prevent and mitigate adverse impact are implemented (8 pts).
- c. Risks and impacts on community health and safety are regularly monitored. No actual damage is identified, but either no or only minimum measures necessary to prevent adverse impact are implemented (5 pts).
- d. Neither risks nor impacts on community health and safety are regularly monitored. Only minimum measures necessary to mitigate adverse impact are implemented in response to actual damage (2 pts).
- e. Neither risks nor impacts on community health and safety are regularly monitored. No measures to mitigate actual damage are implemented (0 pts).

7.3.2 Neighbor and community relations: Which of the following best describes the level of management of neighbor and community relations on your farm for your local community (select one) (10 pts)?<sup>53</sup>

- a. Communication channels between the farm owners and the community are formally established and used regularly. Community concerns are addressed voluntarily in a transparent and systematic way. The farm owners also identify opportunities for community support and implements appropriate programs (10 pts).
- b. Communication channels between the farm owners are formally established and used regularly. Community concerns are addressed voluntarily in a transparent and systematic way (8 pts).
- c. Communication channels between the farm owners and the community are formally established but not used regularly. Community queries and grievances are addressed voluntarily on an ad-hoc basis (5 pts).
- d. Communication channels between the farm owners and the community are not formally established. Community concerns are addressed on an ad-hoc basis; community grievances are addressed reactively, i.e. only if demanded by local authorities (2 pts).
- e. Communication channels between the farm owners and the community are not formally established. Community concerns are not addressed (0 pts).

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#### KEY PERFORMANCE INDICATORS

<sup>51</sup> Jackson-Smith and Gillespie 2005.

<sup>52</sup> Fontes 2014

<sup>53</sup> Fontes 2014



7.3.3 **Education and Outreach:** Introducing people to dairy agriculture on your farm can be an effective method for informing non-farmers about your practices and the importance of dairy agriculture: Approximately how many visitors toured and learned about dairy agriculture on your farm in the last calendar year?<sup>54</sup>

7.3.4 **Neighbor and community relations:** Discussing your practices and operations face-to-face with neighbors is one of the most effective ways to create a good relationship with your neighbors. What percent of abutting neighbors (people living adjacent to your properties) have you had met with face-to-face to discuss farming and/or activities on your farm in the last 1 ½ years?

#### OTHER OUTCOMES

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7.3.5 **Volunteering:** Many dairy farmers play a vital role in their local communities by volunteering their time to make their communities stronger. Approximately how many hours did you volunteer in the last calendar year for charitable organizations and in local government?<sup>55</sup>

7.3.6 **Local economy:** Using local service providers and suppliers can support the local economy and agricultural economy. A local supplier or local service providers include companies within 200 miles of your farm or within your state whichever is greater. What percentage of dairy farm expenditures for supplies and services were spent on local suppliers and/or local service providers in the last year?

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#### 7.4 SUSTAINABILITY INDICATOR

7.4.1. Many regulations applied to agriculture were developed to protect public health and safety. These can include local, state, and federal regulations concerning air and water quality, waste management, application of farm chemicals, driving record, and manure management. Farmers have an obligation to adhere to regulations and in doing so build confidence of neighbors in a farms' operations.

**a. Compliance with public health and safety laws:** When a farm has had no regulatory actions in the last year OR is compliant with corrective action plans then the dairy is considered sustainable. Which of the following best describes the compliance of your dairy farm with local, state, and federal regulations concerning air and water quality, waste management, application of farm chemicals, driving record, and manure management ("b" or better is sustainable)?

- a. Mostly doesn't not meet regulatory compliance
- b. Mostly compliant with OR mostly compliant and undergoing corrective action response (1 pt)
- c. Always compliant with OR currently compliant with and have fulfilled corrective action plans for compliance failures (5 pts)
- d. Always compliant with and Mostly Exceed (7 pts)
- e. Always compliant with and Far Exceed (10 pts)

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<sup>54</sup> Farm Indicator 3.3: Educational Opportunities (Innovation Center for U.S. Dairy 2014).

<sup>55</sup> Farm Indicator 3.1: Community Volunteering/Capacity Building (Innovation Center for U.S. Dairy 2014).

## PLANET

The planet refers to various aspects of the environment and natural world that provide essential benefits to support all living things. Agriculture will no doubt come under increasing scrutiny with regard to its environmental impacts unless farmers can show that they are already acting in environmentally responsible ways<sup>56</sup>. This can help avoid regulatory burdens and be used to explain to customers and consumers how dairy farmers are land stewards. Key topics include animal care and well-being, biodiversity (including wildlife), land stewardship, energy, waste, and greenhouse gas emissions, and water (both quantity and quality).

### TOPIC #8 - ANIMAL CARE AND WELL-BEING

Dairy farmers focus many of their efforts on maintaining the health of their cows because well-cared-for cows produce high-quality milk. They maintain their herd health by providing nutritious diets, good living conditions and good medical care. Most farmers participate in animal care programs to help demonstrate that they have a caring relationship with their animals. Farmers that don't provide adequate care for their cows can undermine the reputation of the industry and viable markets for dairy products.

#### 8.1 AWARENESS INDICATOR

Dairy farms rely on healthy, productive cows. Participation in animal care programs sends a clear signal to buyers, processors, and consumers about the importance of animal care. Widely recognized programs include: American Humane Certified™, Animal Welfare Approved, Certified Humane Certification Program, Food Alliance, Global Animal Partnership's 5-Step Program, Humane Farm Animal Care, Milk and Dairy Beef Quality Assurance Program, National Milk Producers Federation FARM Program, New York State Cattle Health Assurance Program (NYS CHAP), and Northwest Sustainable Dairies. By sustaining healthy cows, farmers are able to maintain their reputation for animal care and maximize milk production on their farms.

8.1.1 Does your farm currently participate in a widely recognized animal well-being program (0.8 pt)?<sup>57</sup>

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

#### 8.2 PRACTICE INDICATORS<sup>58</sup>

8.2.1 Health Management: Management includes having a Herd Health Plan, standard operating procedures (SOPS), employee/family worker training, and record keeping. Which of the following herd management BMPs do you apply on your farm (1.5 pts)?

- a. The dairy has a documented Veterinarian/Client/Patient Relationship (0.5 pt).<sup>59</sup>

<sup>56</sup> Aigner et al. 2003

<sup>57</sup> Farm Indicator 1.1: Animal Care Guidelines (Innovation Center for U.S. Dairy 2014).

<sup>58</sup> Includes major BMPs from the NMPF FARM Program (National Milk Producers Federation 2013).

<sup>59</sup> Farm Indicator 1.2: Veterinary Care (Innovation Center for U.S. Dairy 2014).

- b. Documentation exists of training for new and existing animal caretakers at least on an annual basis (0.2 pt).
- c. Written SOPs are readily available, and in many cases posted, in the native languages of personnel assigned animal care responsibilities and cover Herd Health Plan, newborn management, feed and nutrition management, and non-ambulatory animal management (0.2 pt)
- d. Emergency contact information is readily available to address animal care needs arising from unique circumstances such as a fire or natural disaster, equipment failures and power failures (0.2 pt).
- e. Each animal is permanently identified and an effective record-keeping system is employed for animal care and management decision making (0.2 pt).<sup>60</sup>
- f. A specific milking routine, procedures and actions are followed to ensure cow comfort and well-being (0.2 pt).

8.2.2 Calf Care: To thrive, calves require special attention to diet, including colostrum intake which entails adequately training employees/family workers for their care. Which of the following calf care BMPs do you apply on your farm (1.2 pts)?

- a. All calves receive colostrum or colostrum replacer soon after birth, even if immediately transported off the farm (0.2 pt).
- b. Calves receive a volume and quality of milk or milk replacer to maintain health, growth and vigor until weaned or marketed (0.2 pt).
- c. Calves have access to palatable, clean, fresh water as necessary to maintain proper hydration (0.2 pt).
- d. Calves are offered fresh, palatable starter feed (0.2 pt).
- e. Identified animal caretakers are trained in calf care nutritional requirements, including use of esophageal tube feeders and other feeding mechanisms (0.2 pt).
- f. Tail docking is planned to be phased out or does not occur (0.2 pt).

8.2.3 Nutrition: Animals require a routine of adequate feed and water to provide sufficient nutrition to live and be highly productive. Which of the following nutrition BMPs do you apply on your farm (1.5 pts)?

- a. All animals have access to clean, fresh water as necessary to maintain proper hydration (0.3 pt).
- b. Rations provide the required nutrients for maintenance, growth, health and lactation for the appropriate physiological life stage (0.3 pt).
- c. Feed equipment is washed and disinfected after being used for non-feed purposes (0.3 pt).
- d. Sufficient feed bunk space is provided that allows all animals to feed at the same time or sufficient quantities of feed are available for all animals during a 24-hour period (0.3 pt).
- e. Employees/family workers who feed are formally trained in preparing and dispensing feed (0.3 pt).

8.2.4 Animal Health: A Herd Health Plan can create a platform for ensuring appropriate nutrition, housing, and disease prevention and detection, along with treatment that helps maintain herd health. Which of the following animal health BMPs do you apply on your farm (1.7 pts)?

- a. The dairy has a written Herd Health Plan, developed in consultation with the herd veterinarian, to prevent common diseases or conditions such as mastitis, lameness, metritis, metabolic diseases, displaced abomasum, pneumonia and infectious diarrhea (0.5 pt).
- b. The Herd Health Plan is reviewed and updated annually (0.1 pt).
- c. Navels are dipped in an effective antiseptic solution as soon as possible (0.1 pt).
- d. Calves are disbudded at eight weeks of age or earlier and with appropriate use of analgesics and/or anesthetics (0.1 pt).

<sup>60</sup> Standard TI.a (Assurance Food Safety 2014).

- e. All other planned medical procedures are performed at the earliest age possible and with appropriate use of analgesics and/or anesthetics (0.1 pt).
- f. Ninety percent or more of all animals in all pens score 2 or less on the NDFP Hygiene Scorecard (1 is clean, 4 is dirty) (0.1 pt).
- g. Ninety-five percent of the lactating and dry dairy herd scores a 2 or less on the NDFP Locomotion Scorecard (1 is sound, 2 is moderately lame, 3 is severely lame) (0.1 pt).
- h. The dairy farmer is taking action to improve animals with severe lameness (0.1 pt).
- i. A lameness prevention protocol is in place (0.1 pt).
- j. Ninety-nine percent of all classes of animals score a body condition score of 2 or more on the NDFP Body Condition Score Scorecard (1 is thin, 5 is fat) (0.1 pt).
- k. The dairy farmer is taking action to improve animals with body condition scores less than 2 (0.1 pt).
- l. Ninety-five percent or more of lactating and dry dairy herd score a 2 or less on the NDFP Hock and Knee Lesion Scorecard (1 is no hair loss/ swelling, 2 is some hair loss; no swelling, 3 is severe swelling and/or abrasion through hide) (0.1 pt).
- m. Medications are only used following manufacturer- and veterinarian-prescribed label directions and withdrawal times (0.1 pt).

8.2.5 Environment and Facilities: Proper management of the cow's environment can protect them from weather extremes and ensure their safety and care. Which of the following facilities BMPs do you apply on your farm (1.2 pts)?

- a. Protection from heat and cold are provided for all age classes; using shade, fans, water cooling, and/or windbreaks (0.2 pt).
- b. Protocols are in place to minimize airborne particles as a way to reduce odors and dust (0.2 pt).
- c. Housing allows cattle to easily stand up, lie down, adopt normal resting postures and have visual contact with other cattle (0.2 pt).
- d. Cattle have a bed that provides comfort, insulation, warmth, dryness and traction (0.2 pt).
- e. The dairy farmer monitors and takes action for slips and falls (0.2 pt).
- f. A clean, dry, well-lit, well-ventilated calving area is used (0.2 pt).

8.2.6 Handling, Movement, and Transportation: Which of the following handling BMPs do you apply on your farm (1.4 pts)?

- a. Animal caretakers working in animal movement are trained on the principles of flight zones and flight distances to know the importance of controlling the animal movement in lanes, alleyways and other parts of the complex (0.2 pt).
- b. Animal caretakers have signed a cow care agreement written in their primary language (0.4 pt).
- c. The dairy uses the "Top 10 Considerations for Culling and Transporting Dairy Animals" in handling and transportation decision making (0.2 pt).
- d. Animal caretakers are trained to handle and restrain calves with a minimum of stress to the animal (0.2 pt).
- e. Calves are moved by lifting, walking or mechanical conveyance (0.2 pt).
- f. Transport devices used to move calves are clean, and properly designed and maintained (0.2 pt).

8.2.7 Special-Needs Animals: Being prepared for special-needs animals is a key step for successfully managing these cows and minimizing stress to the cow and employees/family workers. Which of the following special needs BMPs do you apply on your farm (1.5 pts)?

- a. Special-needs animals are not restricted from feed and water for more than four hours (0.2 pt).

- b. The Herd Health Plan addresses non-ambulatory animal management and includes specific protocols for euthanasia consistent with recommendations from the American Association of Bovine Practitioners and the American Veterinary Medical Association (0.3 pt).
- d. Facilities are provided to segregate sick or injured animals; these facilities provide protection from weather (0.2 pt).
- e. Self-locking stalls provide an emergency release for a non-ambulatory situation (0.2 pt).
- f. Timely and prompt marketing of animals is part of the management plan (0.2 pt).
- g. Designated animal caretakers have been trained and proper equipment is available to move non-ambulatory animals. Special equipment for injured or non-ambulatory animals is available (0.2 pt).
- h. Trained animal caretakers are available when sick, injured, non-ambulatory or dead animals must be moved (0.2 pt).

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### 8.3 PERFORMANCE INDICATORS

#### KEY MANAGEMENT INDICATOR

9.3.1 **Animal care and well-being:** Which of the following best described the level of animal care management on your farm (10 pts)?<sup>61</sup>

- The dairy participates in a widely recognized animal well-being program, has a written Herd Health Plan, and has a documented Veterinarian/Client/Patient Relationship. Appropriate measures are applied to support good health, exhibition of normal behavior, adequate feedings, and adequate space for cows. The dairy also takes proactive action to ensure animal well-being (e.g., employee training) (5 pts).
- The dairy participates in a widely recognized animal well-being program, has a written Herd Health Plan, and has a documented Veterinarian/Client/Patient Relationship. Appropriate measures are applied to support good health, exhibition of normal behavior, adequate feedings, and adequate space for cows (4 pts).
- The dairy participates in a widely recognized animal well-being program, has a written Herd Health Plan, and has a documented Veterinarian/Client/Patient Relationship. No actual harm to cows is identified, but only minimum measures necessary to promote good health, exhibition of normal behavior, adequate feedings, and/or adequate space (3 pts).
- The dairy participates in a widely recognized animal well-being program and has a Herd Health Plan that is not written down. It lacks a documented Veterinarian/Client/Patient Relationship. Only minimum measures necessary to mitigate adverse impacts to animal well-being are implemented in response to impacts to animal well-being (1 pts).
- The dairy does not currently participate in a widely recognized animal well-being program, and lacks a Herd Health Plan and a documented Veterinarian/Client/Patient Relationship. No measures to mitigate adverse impacts to animal well-being are implemented (0 pts).

#### KEY PERFORMANCE INDICATORS

9.3.2 **Milk Quality:** The Somatic Cell Count (SCC) is a key indicator of milk quality. Most somatic cells are white blood cells which can increase in numbers in milk as an immune response to a mastitis-causing pathogen. Farmers are financially rewarded for low herd SCCs and penalized for high ones, because cell counts reflect the quality of the milk produced. A low SCC indicates better animal health. As the number of somatic cells increases, milk production is likely to fall, primarily due to mastitis pathogens.

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<sup>61</sup> Based on National Milk Producers Federation (2013), Veissier et al. (2011), and Fontes et al. (2014).

**a. Average Somatic Cell Count:** [standard laboratory procedure]

9.3.3 **Herd Nutrient Balance:** Milk urea nitrogen is the fraction of milk protein that is derived from blood urea nitrogen (MUN). It can become abnormal with changes in ration balancing, feeding management and nutrient balance. It may be a useful test for diagnosing herd problems and identifying opportunities to improve protein supply in feed though other additional is necessary to ensure optimal diets.

**a. Average Milk Urea Nitrogen Level:** [standard laboratory procedure]

9.3.4 **Cull Rate:** Farmers cull dairy cows to remove unhealthy and less productive cows from the herd. Excessive cull rates can increase expenses and increase the relative environmental impact, including emissions of greenhouse gases.

**a. Average Annual Cull Rate** = Number of cows removed due to poor health or low productivity / Herd size

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#### 8.4 SUSTAINABILITY INDICATOR

8.4.1 **Animal Care:** People differ widely in their assessment of animal care on dairy farms. Animal care programs are well-established and are advised by scientists and veterinarians to ensure that they are science-based. They are used to provide a reference or benchmark for farms regarding animals care. Meeting or exceeding the standards of these programs indicates that a farmer is providing sufficient care for his/her cows. (sustainable would be “C” or better)

**a. Animal Care Program Participation:** Do you meet or exceed the standards of an animal care program (“c” is considered sustainable) (10 pts)?

- a. Currently doesn't participate or mostly does not meet
- b. Mostly compliant with OR mostly compliant and undergoing corrective action response (1 pt)
- c. Always compliant with OR currently compliant with and have fulfilled corrective action plans for compliance failures (5 pts)
- d. Always compliant with and Mostly Exceed (7 pts)
- e. Always compliant with and Far Exceed (10 pts)

## TOPICS #9 - LAND STEWARDSHIP

Land stewardship is the responsible use of natural resources to maintain productivity of lands for present and future generations. In agriculture, the focus is primarily on the productivity and management of agricultural lands though conservation of wildlife and their habitats can also be a consideration.

### 9.1 AWARENESS INDICATOR

9.1.1. **Nutrient Management Plan:** A nutrient management plan helps ensure the effective and efficient use of manure and other nutrients on a farm. Does your farm currently have a written nutrient management plan that is approved by state agencies or the NRCS in your state (1 pt)<sup>62</sup>?

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- D. Yes (0.8 pt)

### 9.2 PRACTICE INDICATORS

Land stewardship is managing land responsibly for your benefit and for the benefit of future generations. It entails appropriate management of croplands, pasture, pests, and soils, including management of their nutrients.

#### NUTRIENT MANAGEMENT (4 PTS)

Nutrient management is the system used by farmers to manage the amount, form, placement, and timing of the application of nutrients to plants. In dairy agriculture, it also includes the management and use of manure. Careful nutrient management can improve productivity and profitability, and reduce excess nutrients, and reduce their loss to the environment.

#### NUTRIENT MANAGEMENT PLANNING (2 PTS)<sup>63</sup>

9.2.1. **Updating Your Nutrient Management Plan:** How often is the nutrient management plan for your farm updated (0.5 pt)?

- a. Every 5 years or less often (0 pt)
- b. Every 3 years (0.25 pt)
- c. Every year (0.5 pt)

9.2.2. **Setbacks:** Which of the following best describes your setback practices on your farm to keep nutrients from getting into surface water (0.5 pt)?

- a. I don't use setbacks when storing manure and applying nutrients (0 pt)
- b. I follow state-level setbacks for storing manure away from water bodies (0.25 pt)
- c. I follow state-level setbacks when applying nutrients near water bodies and flowing water (0.45 pt)

<sup>62</sup> Any nutrient management plan that includes the minimum specific elements of the NRCS Comprehensive Nutrient Management Plan (CNMP) can be considered.

<sup>63</sup> Incorporates portions of Unilever Sustainable Agriculture Code, Section 2.3, Nutrient Management (King et al. 2010).

- d. I exceed state-level setbacks when applying nutrients near water bodies and flowing water (0.5 pt)

9.2.3. Feed Management: Which of the following practices are used to control nutrient levels in animals diets (1 pt)

- a. Diets are formulated to meet the requirements of the animals by a nutritionist, feed company, or software (0.14 pt)
- b. Animals are feed by groups (high producers, low producers, dry cows, close-up cows, heifer groups) (0.14 pt)
- c. There is a system for evaluating diet dry matter on the farm (0.12 pt)
- d. Diets are adjusted daily to weekly for changes in dry matter (0.12 pt)
- e. Dry matter intake is determined daily to monthly (0.12 pt)
- f. Heifer diets are tracked by monthly Average Daily Gain and/or month of first calving (0.12 pt)
- g. Diets are routinely analyzed for nutrients (e.g., N, P, K, NDF, CP, ADF) (0.12 pt)
- h. Manage for optimal protein levels in feed by groups (0.12 pt)

#### MANURE STORAGE (1 PT)

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9.2.4. Manure Storage: Which of the following best describes your manure storage system (select one) (0.5 pt)?

- a. I don't have a manure storage system (0 pts)
- b. Meets your needs for your herd size and the storage period (0.3 pts)
- c. Complies with regulatory requirements for capacity and construction design (0.45 pts)
- c. Exceeds with regulatory requirements for capacity and construction design (0.5 pts)

9.2.5. Alternative Manure Management Systems: Which of the following alternative manure management systems do you use to improve nutrient management (select all that apply) (0.5 pt)?

- a. None (0 pt)
- b. Compost manure (0.1 pt) (includes conformity with NRCS Practice code 317)
- c. Manure digester (0.1 pt) (includes conformity with NRCS Practice codes: 365 and 366)
- d. Whole farm nutrient management which considers the import and losses of nutrients on the farm and export of milk, meat, crops, or manure (0.3 pt).

#### MANURE AND FERTILIZER APPLICATION (1 PT)

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9.2.6. Frequency of Soil Testing: How often do you typically test the soil for nutrients in your fields and pastures (0.5 pt)?

- a. Every 6 years or less often (0 pt)
- b. Every 3 to 5 years or as yields dictate (0.25 pt)
- c. Every 1 to 2 years (0.5 pt)

9.2.7. Nutrient Application Levels: Which of the following practices do you apply to manage nutrient levels when applying manure and other fertilizers (check all that apply) (0.5 pt)?

- a. Test your manure for N, P, and K levels before spreading and/or irrigating (0.08 pt)
- b. Set nutrient applications based on a nitrogen balance (0.04 pt)
- c. Set nutrient applications based on a phosphorous balance (0.08 pt.)
- d. Calibrate your manure spreader(s) so that you know your application rate (0.08 pt)



- e. Spread your manure over wide enough acreage to address regulatory requirements and/or avoid excessive levels of nutrients in soils (can include distribution off farm) (0.06 pt.)
- f. Set your manure and fertilizer application rates based on crop needs (0.08 pt.)
- g. Take a legume nitrogen credit when you plow down legumes in a crop rotation (0.02 pt.)
- h. Regularly measure nutrient value of grown feed, forage, and pasture as part of forage management (0.06 pt)
- i. use other materials for nutrients (e.g., biosolids, wood ash)

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## SOIL, CROPLAND, AND PASTURE STEWARDSHIP (3 PTS)

The stewardship of farmland and its soils is essential to ensuring sustainable production of feed and forage for your farm's dairy herd. It can take considerable investment but can lead to reduced feed costs and impacts to the environment.

9.2.8. Field Records: Which of the following records do you keep for each field and use it their management (check all that apply) (1 pt)?<sup>64</sup>

- a. Crop yields (0.09 pt)
- b. Pasture rotations (0.03 pt)
- c. Manure application rates (0.09 pt)
- d. Fertilizer application rates (0.09 pt)
- e. Soil tests (0.2 pts)

9.2.9. Soil Conservation: Which of following soil conservation BMPs do you apply as needed to minimize erosion and compaction (1 pt)?<sup>65</sup>

- a. The risk of soil erosion and loss is routinely assessed and managed **OR** soil erosion does not occur on my farm (0.34 pt)
- b. The risk of soil erosion from fields is seasonally assessed and managed (e.g. erosion control, riparian buffer strips, drain design) **OR** soil erosion does not occur on my farm (0.33 pt)
- c. The risk of soil compaction is annually assessed and managed **OR** soil compaction does not occur on my farm (0.33 pt)

9.2.10. Crop and Pasture Stewardship: Which of following crop and pasture stewardship BMPs do you apply as needed to maintain soil health minimize erosion and compaction (1 pt)?

- a. Apply crop rotation that includes a perennial crop (0.3 pt)
- b. Limit the number of consecutive years of planting annual crops (e.g., corn, soybeans, cereal grain) in your crop rotation (0.25 pt)?
- c. Apply no-till or minimum-till planting techniques (includes conformity with NRCS Practice codes 345, 329, 346) (0.25 pt.)
- d. Use cover cropping at least one winter in five (0.2 pt)

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## PEST MANAGEMENT (3 PTS)<sup>66</sup>

<sup>64</sup> Incorporates portions of Unilever Sustainable Agriculture Code, Section 3.3, Soil Management (King 2010).

<sup>65</sup> Incorporates portions of Unilever Sustainable Agriculture Code, Section 3.3, Soil Management (King 2010).

<sup>66</sup> Incorporates portions of Unilever Sustainable Agriculture Code, Section 2.4 Pest Management (King et al. 2010).

Pest management includes managing insect and weed pests of forage and feed crops as well as pest control around barns and other facilities. Pest control in fields reduces crop losses and associated costs and increases the efficiency of your operations. Pest control in barns reduces feed losses and maintains herd health. When well-managed, pest management reduces losses and does not compromise animal welfare, employee/family worker health, or the environment. Careful planning and management of pesticides can ensure that you are able to achieve your pest control goals at a low cost.

9.1.2. Integrated Pest and Weed Management (IPM) Plan: An IPM plan focuses on effective control of pest outbreaks in the barn, on cropland, in forage or elsewhere to minimize damage and costs. It incorporates pest monitoring, safety, and proper application of chemicals. Does your farm currently have an Integrated Pest and Weed Management plan (1 pt)?<sup>67</sup>

- a. Hardly or not at all (0 pts)
- b. Somewhat (0.2 pt)
- c. Mostly (0.7 pt)
- d. Yes (1 pt)

9.2.11. Application Best Management Practices (BMPs): Which of the following practices do you or your pesticide applicator apply on your farm (0.5 pts)<sup>68</sup>?

- a. Do not use pesticides, herbicides and fungicides on your farm (0.5 pts)
- b. Have a pesticide licensed employee, family worker, and/or contractor to apply pesticides, herbicides and/or fungicides on your farm (0.2 pt)
- c. Keep records of all chemical applications by field, crop and year (0.05 point)
- d. Only use pesticides, herbicides and/or fungicides registered for use within your state (0.15 pt)
- e. Use cultural control to prevent build-up or survival of weed seeds and pest eggs and larvae (0.1 pt)

9.2.12. Pesticide selection: Which of the following factors do you consider when selecting pesticides, herbicides, and/or fungicides (select all that apply) (0.5 pts)?

- a. Chemicals to target specific pests or weeds (0.3 pt)?
- b. Chemicals with the lowest toxicity, potential environmental impact, and/or least potential negative impact to beneficial organisms (0.15 pt)?
- c. Chemicals with low risk of developing resistance by pests or weeds and avoid those with known pest-resistance problems (0.05 pt)?

## PESTICIDE APPLICATION (1 PTS)

Careful application of pesticides can help minimize application costs, maximize the effectiveness of pesticides in reducing losses, and protect you, your employee, family workers, and environment.

9.2.13. Pre-application practices: Which of the following practices do you employ when scouting and applying pesticides, herbicides, and/or fungicides (select only one) (0.45 pts)?

- a. apply them without scouting fields (0 pts)
- b. scout fields and only spray fields that are in need (0.3 pt)
- c. scout fields and spot spray affected areas of fields (0.45 pts)

<sup>67</sup> Follows WWF (2015) - F. Pollution, Waste, and Greenhouse Gas Emissions Indicator 51

<sup>68</sup> Follows WWF (2015) - F. Pollution, Waste, and Greenhouse Gas Emissions Indicators 53 and 54,

9.2.14. Application practices: Which of the following practices do you use when applying pesticides, herbicides, and/or fungicides (check all that apply) (0.45 pts)?

- a. maintain legally required spray buffers around water bodies (0.15 pt)
- b. dispose of all chemical-contaminated materials in a way that meets legal requirements (0.1 pt)
- c. check application equipment and calibrate your sprayer more than once a year (0.05 pt)
- d. conduct annual training to employees/family workers who come in contact with chemicals that require safety training (0.15 pt)

9.2.15. Rodent and Fly Control: Which of the following practices do you usually apply first to control flies and small animals (birds and rodents) (select all only one) (0.1 pt)?

- a. Cultural methods (i.e., trapping, barriers, draining standing water, composting manure) (0.1 pt)
- b. Cultural methods plus chemical control (0.07 pt)
- c. Chemical control (0.01 pt)

9.2.16. Weather factors during application: How does weather factor into your application of pesticides, herbicides, and/or fungicides (check one of the following) (0.3 pt)?

- a. weather does not factor into application **AND/OR** I apply at any time (0 pt)
- b. apply only in no- to low-wind periods (0.15 pt)
- c. apply only in low- to no-wind periods using drop nozzles (0.3 pt)

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### 9.3: PERFORMANCE INDICATORS

#### KEY MANAGEMENT INDICATOR

9.3.1 **Nutrient Management**: Which of the following best described the level of nutrient management on your farm (10 pts)?<sup>69</sup>

- a. The dairy follows a written nutrient management plan that is approved by a state agency or NRCS, and relies on the advice of a crop consultant for determining levels of nutrient application. Appropriate measures are applied to minimize nutrient loss and optimize nutrient use and avoid unnecessary pesticide impacts while maintaining productivity, protecting ground and surface water quality, maintaining soil health, and benefiting farm financial returns. The farm also takes many proactive actions to nutrient and pest management (e.g., employee training, annual soil sampling, use of precision ag.) so that significant negative impacts are avoided (10 pts).
- b. The dairy follows a written nutrient management plan that is approved by a state agency or NRCS, and relies on the advice of a crop consultant for determining levels of nutrient application. Appropriate measures are applied to minimize nutrient loss and optimize nutrient use and avoid unnecessary pesticide impacts while maintaining productivity, protecting ground and surface water quality, maintaining soil health and benefiting farm financial returns (8 pts).
- c. The dairy follows a written nutrient management plan that is approved by a state agency or NRCS and uses IPM. No actual harm to soil health or water quality is noted, but dairy only applies minimum measures necessary to minimize nutrient loss and optimize nutrient use and avoid unnecessary pesticide impacts while maintaining productivity, protecting ground and surface water quality, maintaining soil health, and benefiting farm financial returns (5 pts).

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<sup>69</sup> NRCS, NHCP 2011. Nutrient management. Natural resources conservation service conservation practice standard. 590-1  
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- d. The farm has a written nutrient management plan and IPM that is haphazardly followed. Minimum measures necessary to mitigate adverse impacts are only implemented when there are large impacts to soil health and ground and surface water quality (2 pts).
- e. The dairy lacks a written nutrient management plan and IPM. No measures to mitigate adverse impacts to soil health and ground and surface water quality are implemented (0 pts).

## KEY PERFORMANCE INDICATORS

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### NUTRIENT MANAGEMENT

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9.3.2 **Manure use:** Percentage of manure generated that is managed according to a nutrient management plan.

9.3.3 **Nitrogen recovery rate:** Ratio of the amount of nitrogen in the harvested crop to the amount of nitrogen applied<sup>70</sup>. Typically these data are identified in a nutrient management plan.

### SOIL CONSERVATION

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9.3.4 **Conservation Tillage:** Percent of planted acres leaving > 30 percent residue (mulch, ridge, and/or no-till).

9.3.5 **Cover crop coverage:** Percent of cultivated areas where cover crops are used.

### PESTICIDE USE:

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9.3.6 **Pesticide use:** Pounds of active ingredient of pesticides, herbicides, and fungicides applied / acre of crop land, pasture, and forage area (pounds/acre). Active ingredient amounts are reported on the label.

9.3.7 **Use of low risk pesticides:** Percent of active ingredient of pesticides, herbicides, and fungicides applied that don't require buffers near waterbodies / total pounds of active ingredient of pesticides, herbicides, and fungicides applied (percent). Similar to Chemical Use metric in the Unilever Sustainable Agriculture Code - Appendix 1.

## 9.4 SUSTAINABILITY INDICATORS

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9.4.1. **Soil erosion (%):** Percent of cropland, forage land, and pasture where the ratio of annual soil loss (tons/acre) is less than the annual soil formation (tons/acre). If 100% then a farm operation should be sustainable.

7.4.2. **Pesticide use:** Many regulations governing the use of chemicals including pesticide in agriculture were developed to protect public health. These can include local, state, and federal regulations concerning air and water quality and application and management of farm chemicals. When a farm has had no regulatory actions in the last year OR is compliant with corrective action plans then the dairy is considered sustainable. Which of the following best describes the compliance of your dairy farm with local, state, and federal regulations concerning pesticides and management of farm chemicals ("c" or better is sustainable)?

- a. Mostly doesn't not achieve compliance with regulations related to the application and management of pesticides

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<sup>70</sup> Similar to Nitrogen Balance metric in Unilever Sustainable Agriculture Code - Appendix 1.

- b. Mostly compliant with regulations OR mostly compliant and undergoing corrective action response (1 pt)
- c. Always compliant with regulations OR currently compliant with and have fulfilled corrective action plans for compliance failures (5 pts)
- d. Always compliant with regulations and mostly exceed regulations (7 pts)
- e. Always compliant with regulations and far exceed regulations(10 pts)

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## TOPIC #10. ECOSYSTEM CONSERVATION<sup>71</sup>

An ecosystem is a complex set of relationships among species and their chemical and physical environment in an area. It takes in biodiversity, the vast diversity of life and includes wildlife. It also includes natural capital which are the key natural benefits provide by nature to farmers and surrounding communities, such as game, fish, fire wood, lumber, wild nuts, fruits, and berries, recreation, flood control, climate regulation, and clean water.

### 10.1 AWARENESS INDICATORS

9.1.3. Ecosystem Management Plan: Many different farm plans take into account ecosystem conservation. Does your farm currently have an ecosystem conservation plan that is approved by state agencies, NRCS in your state or is part of an easement? This can include nutrient management plan, an NRCS conservation or soil conservation plan, participation in an NRCS program, easements, or a forest management plan Yes (0.8 pt)<sup>72</sup>?

- a. Hardly or Not at All (0 pt)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- D. Yes (0.8 pt)

### 10.2 PRACTICE INDICATORS

#### CONSERVATION PLAN (2 PT)

10.2.1. Conservation Plan: Do you have a conservation or wildlife plan for your farm or do you participate in any of the following conservation programs (select all that apply) (2 pt)?

- a. No (0 pt)
- b. I have my own conservation and/or wildlife plan (0.02 pt)
- c. NRCS Conservation Programs (ACEP, EQIP, WHIP, CSP, GLCI, AMA, Other) (0.03 pt)
- d. State or regional conservation program (0.03 pt)
- e. Farmland conservation easement (0.03 pt)
- f. Land conservation easement (0.03 pt)
- g. Forest management plan (0.03 pt)
- h. Other programs or tools used (please provide the name) (e.g., high conservation value assessments) (0.03 pt) \_\_\_\_\_

#### HABITAT MANAGEMENT (8 POINT)

10.2.2. Habitat Management: Which of the following habitat types do you manage for conservation values? (0.5 pt)

- a.  or  NA Forests (0.1 pt if Yes or NA)

<sup>71</sup> Includes draft Wildlife indicators from the Innovation Center for U.S. Dairy (2014). Incorporates portions of Unilever Sustainable Agriculture Code, Section 5.3 Biodiversity Protection and Enhancement (King et al. 2010).

<sup>72</sup> Nutrient management plan includes addressing the minimum specific elements of the NRCS Comprehensive Nutrient Management Plan (CNMP).

- b.  or  NA Grasslands (0.1 pt if Yes or NA)
- c.  or  NA Wetlands (0.1 pt if Yes or NA)
- d.  or  NA Marginal lands (0.1 pt if Yes or NA)
- e.  or  NA Waterbodies (0.1 pt if Yes or NA)
- f.  or  NA Other (list) (0.1 pt if Yes or NA) \_\_\_\_\_

10.2.3. Wildlife-friendly management techniques for fields and cropland: Which of the following practices do you apply to fields and/or croplands that benefit wildlife (check NA if not applicable to your farm) (0.5 pt)?

- a.  or  NA Crop rotation (0.04 pt)
- b.  or  NA Buffer strips (0.09 pt)
- c.  or  NA Grass waterways (0.04 pt)
- d.  or  NA Contour farming (0.07 pt)
- e.  or  NA Restricted livestock access to water bodies (0.09 pt)
- f.  or  NA Residue left in field (0.04 pt)
- g.  or  NA Other conservation Practices (please list): \_\_\_\_\_ (0.04 pt)
- h.  or  NA Other conservation Practices (please list): \_\_\_\_\_ (0.04 pt)

10.2.5. Rare species and habitats: Every state has a natural heritage program which can provide information about state or federally listed species and state-listed natural habitats (S1 and S2, G1, and G2) on your land. Has your land been evaluated for the occurrence of state/ federally listed species and/or state-listed natural habitats (S1 and S2, G1, and G2) and, if present, is there a conservation plan in place (maybe local, state, or federal) and/or have you applied conservation practices to maintain them on your land?

State and/or federally listed species	<input type="checkbox"/> a. occurrence not evaluated	<input type="checkbox"/> b. occurrence evaluated	<input type="checkbox"/> c. Conservation plan in place and/or maintained on land
State-listed habitats (S1 and S2, G1 and G2)	<input type="checkbox"/> d. occurrence not evaluated	<input type="checkbox"/> e. occurrence evaluated	<input type="checkbox"/> f. Conservation plan in place and/or maintained on land

10.2.6. Riparian Area Management: Conserved riparian areas provide habitat for riparian and aquatic species and help protect water quality of aquatic ecosystems. Which of the following practices are applied on your farm land next to water bodies (streams, rivers, lakes, and ponds) and wetlands (select all that apply)(1 pt)?

- a. Mostly maintain a vegetated buffer wider than 30 feet
- b. Apply water quality BMPs for farm road (0.04 pt)
- b. Restrict livestock access to water bodies (0.06 pt)
- c. Stream and water body bank protected from erosion (0.1 pt)

### 10.3: PERFORMANCE INDICATORS

#### KEY MANAGEMENT INDICATOR

10.3.1 **Ecosystem Management:** Which of the following best described the level of ecosystem management on your farm?

- a. Risks and impacts on environmental health are regularly monitored. Appropriate measures to prevent and mitigate adverse impacts to biodiversity in non-cropped areas and water quality are applied. The dairy follows a written conservation or forest management plan that is approved by a state agency or NRCS. The farmer(s) knows whether Federally-listed threatened/ endangered species are present and regulations governing endangered species and water quality. They also take proactive action to maintain environmental health, biodiversity, and water quality (10 pts).

- b. Risks and impacts on environmental health are regularly monitored. Appropriate measures to prevent and mitigate adverse impacts to biodiversity non-cropped areas and water quality are implemented (8 pts).
- c. Risks and impacts on environmental health are regularly monitored. No actual damage to water quality or biodiversity is identified but only minimum measures necessary to prevent adverse impact to environmental health, biodiversity, and water quality are implemented (5 pts).
- d. Neither risks nor impacts on environmental health are regularly monitored. Minimum measures are only applied when there is adverse impacts to environmental health, biodiversity, and water quality (2 pts).
- e. Neither risks nor impacts on environmental health are regularly monitored. Measures to mitigate adverse impacts to environmental health, biodiversity, and water quality are not applied (0 pts).

## KEY PERFORMANCE INDICATORS

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10.3.2 **Wildlife Travel Corridors (%)**: Percentage of the largest river/stream that passes through your property that has at least a 35-foot wide buffer of natural vegetation on both sides? If rivers and/or streams are not present then not applicable.

10.3.3 **Rare species (%)**: Percent of state or federally listed species on your property that have populations managed with a local, state, and/or federal conservation plan or maintained on your land. If state or federally listed species are not present then not applicable.

10.3.4 **Rare habitats (%)**: Percent of state-listed habitats (S1 and S2) on your land that are managed by a conservation plan or maintained on your land. This could be part of a forest management plan. If state-listed habitats are not present then not applicable.

## OTHER OUTCOMES

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10.3.5 **Working lands and open space**: Working lands and open space provide key ecosystem benefits to farmers and surrounding communities beyond the food produced.<sup>7374</sup>

**a. Working lands (%)**: Percent of directly owned lands that are working lands include pasture, cropping acres, and land occupied by barns, parlors, and storage areas.

**b. Semi-natural Lands (%)**: Percentage of directly owned lands in land that does not directly contribute to food production but is too altered by management to be considered natural, including field margins, hedgerows, planted riparian areas, forest plantations, reforested areas, old fields, altered wetlands, non-native grasslands not used in dairy production, etc.

**c. Natural wildlife habitat (%)**: Percentage of directly owned lands in natural forest, natural wetland, and/or natural grasslands. Natural habitats are largely unaltered habitats that include the original, native, dominate tree, wetland, or grass species.<sup>75</sup>

<sup>73</sup> Farm Indicator 3.4: Total Acres of working land and open space and Farm Indicator 2.3: Dairy Working Lands and Open Space (Innovation Center for U.S. Dairy 2014).

<sup>74</sup> Follows using broad habitat categories, a commonly used currency for biodiversity offsets (Quétier and Lavorel 2011).

<sup>75</sup> Similar to Protect and Improve Habitats for Biodiversity metric in the Unilever Sustainable Agriculture Code - Appendix 1.



## 10.4 SUSTAINABILITY INDICATORS

### WILDLIFE AND BIODIVERSITY

Do you have any natural habitats on your properties? Natural habitats are habitats that have not ever been converted to other uses. Forest land that was once cropland or pastures would NOT be a natural habitat.

If **NO** then skip 10.4.1

Are you going to convert land? If **NO** then skip question 10.4.1

**10.4.1. Natural Habitat Maintenance:** Do you conserve natural habitats on your land which contribute to regional conservation (Y/N)? Globally, it is estimate that 10% of habitats will need to be conserved if we are to avoid losing species. When regional efforts conserve  $\geq 10\%$  of different natural habitats, then species may be adequately conserved. At lower level of conservation, landowners can help avoid the loss of biodiversity by conserving specie son their own lands.

a. Is at least 10% of natural forest, wetlands, and/or grasslands conserved within your ecoregion [*a pop-up window will be available so that farmers can determine conservation levels in their ecoregion*]? If so then skip Indicator 10.4.1 as it is non-applicable.

**OR**

b. If  $< 10\%$  of natural forest, wetlands, and/or grasslands is not conserved within your ecoregion, then determine how much natural forest, wetlands, and/or grasslands are conserved within your ecoregion. A landowner should consider conserving up to 10% of his/her natural forest, wetlands, and grasslands if these major habitats occur on his/her farm. Conserved lands can include (1) land sold and held fee for conservation in perpetuity, (2) and protected by easements conversion to other habitat types (including development), and (3) forest lands with modest levels of timber management, including forest lands enrolled under Current Use Taxation programs.

**10.4.2. Rare species (%):** Percent of state and federal listed species on your land which have populations on your farm that are being maintained.

**10.4.3. Rare habitats (%):** Percent of acres of state-listed habitats (S1 and S2) on your land which are being maintained on your farm.

## TOPIC #11 - ENERGY, WASTE, AND GREENHOUSE GAS EMISSIONS

Proper management of energy, waste, and greenhouse gas (GHG) emissions can provide an opportunity to reduce costs and resource use. Because fossil fuel use is central to farm operations and emits CO<sub>2</sub>, energy conservation can save money and reduce GHG emissions.

### 11.1 AWARENESS INDICATOR

The best way to reduce waste and pollution is to save money avoiding their production.

11.1.1. In the last five years or as long as you have owned your farm (whichever is shorter), have you applied practices that save energy, reduce or recycle solid waste, and/or reduce your greenhouse gas emissions each year (0.8 pt)?

- a. Hardly or not at all (0 pts)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

### 11.2 PRACTICE INDICATORS

When well-coordinated, practices reducing farm energy use, waste, and emissions can help reduce production costs, the environmental footprint of your farm, and enhance your reputation in your community. Energy from fossils fuels can contribute to environmental impacts associated with extraction and processing and their combustion.

#### ENERGY MANAGEMENT (4 PTS)

Energy conservation and appropriate use of renewable energy can reduce energy use, costs, and vulnerability to price spikes and increase the energy efficiency of production.

11.2.1. Energy conservation: What energy conservation measures or upgrades have you applied in the last five years (check all that apply)(2 pts)

- a. None (0 pts)
- b. Energy audit (0.4 pt)
- c. purchase Energy Star equipment when available (0.1 pt)<sup>76</sup>

High-efficiency lighting (check one only) (0.2 pt)<sup>77</sup>

- c. 50-85% efficient light bulbs (0.1)
- d. >85% efficient light bulbs (0.2 pt)

High efficiency barn fans (check one only) (0.2 pt)

<sup>76</sup> Austin Green Business Leaders Program (2015)

<sup>77</sup> Austin Green Business Leaders Program (2015)

- e. >50% efficiency fans (0.1 pt)
- f. >85% efficiency fans or you do not need barn ventilation (0.2 pt)

Milk room (check all that apply) (0.3 pt)<sup>78</sup>

- g. Pre-heaters (0.1 pt)
- h. Variable speed vacuum pumps (0.1 pt)
- i. Plate-type milk cooler (0.1 pt)

Field practices (check all that apply) (1 pt)

- j. No/reduced tillage practices (0.6 pt)
- k. Employed other practices that reduce number of passes across a field (0.2 pt)
- l. Fuel switching (from fuel oil or diesel to natural gas or propane) (0.1 pt)
- m. Upgraded to fuel efficient equipment (0.1 pt)

Irrigation pump (check one only) (0.2 pt)

- n. no pump or don't use irrigation (0.2 pt)
- o. variable speed electric (0.15 pt)
- p. electric (0.1 pt)
- q. propane (0.04 pt)

11.2.2. Renewable Energy Use: Which of the following alternative energy sources have you added to your farm operations in the five year (check all that apply) (2 pts)?<sup>79</sup>

- a. Windmills (0.2 pt)
- b. Solar photovoltaic (0.15 pt)
- c. Solar hot water (0.3 pt)
- d. Outdoor wood boiler (0.3 pt)
- e. Other wood energy (0.2 pt)
- f. Geothermal (0.3 pt)
- g. Anaerobic digester (0.4 pt)
- h. Fuel switching (diesel to biodiesel)(0.1 pt)
- i. Plate cooler (0.05 pt)

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### WASTE MANAGEMENT (3 PTS)

Appropriate waste management can reduce exposure of you, family workers, employees, and animals to dangerous chemicals, the threat of regulatory enforcement actions, and environmental impacts and help maintain the reputation of your operations. Some recycling and re-use strategies can reduce disposal fees or even generate income.

11.2.3. Waste Management: Do you apply the following waste BMPS for waste on your farm?(2 pt)

- a. For Haz-mat chemical spills, a plan and spill kit (includes absorbent material; clamps, plugs, and catch basin for leaks, shovel; and tarps to protect soil during field repair jobs) (0.7 pt)<sup>80</sup>
- b. Store fluorescent lamps in a central, safe storage area, box them to avoid breakage, and send them annually to a consolidation or recycling facility (0.3 pt)
- c. Properly store and dispose of animal pharmaceutical waste (0.3 pt)

<sup>78</sup> Austin Green Business Leaders Program (2015)

<sup>79</sup> Austin Green Business Leaders Program (2015)

<sup>80</sup> Austin Green Business Leaders Program (2015)

- d. Properly store and dispose of hazardous waste (e.g., old oil, pesticides, disinfectants) (0.7 pt)<sup>81</sup>

11.2.4. Waste Recycling and Re-use: Which of the following types of waste are regularly recycled and/or re-used on your farm? (1 pt)

- a. Tires (0.1 pt)
- b. Beverage bottles (0.05 pt)
- c. Pesticide containers (0.2 pt)
- d. Silage and hay bale plastic wrap (0.2 pt)
- e. Office paper (0.05 pt)
- f. Cardboard (0.05 pt)
- g. Pallets (0.05 pt)
- h. Metal (0.1 pt)
- i. Motor oil (0.1 pt)
- j. Hydraulic fluids (0.1 pt)

### GREENHOUSE GAS (GHG) EMISSIONS AND AIR QUALITY (3 PTS)

GHG emissions can pollute the air and contribute to climate change. Many GHG reduction strategies can be used to improve farm efficiency and reduce costs and enhance the reputation of your operations. Major sources of GHG emissions from dairy agriculture include N<sub>2</sub>O emissions from fertilizers, soil tillage, and manure, methane (CH<sub>4</sub> from the digestive system of livestock and manure management), carbon dioxide (CO<sub>2</sub>) from burning fossil fuels and conversion of forests and native grasslands to crop land or grassland. In some areas, farms can contribute to air pollution which can affect the health of family, workers, and neighbors<sup>82</sup>.

11.2.5. Nitrogen emissions: Which of the following nutrient application practices do you apply (1 pt)<sup>83</sup>

- a. Techniques that minimize use of chemical nitrogen fertilizers (includes conformity with NRCS Practice code 590))(0.19 pt)
- b. Use manure as the primary source of NPK to meet soil nutrient needs before using commercial fertilizer (includes conformity with NRCS Practice code 590))(0.19 pt)
- c. Use precision-guided farming technologies (e.g., GPS-guided tillage equipment, GPS-guided spray and/or fertilizer equipment) (0.18 pt)
- d. Injection into root zone (0.24 pt)
- e. Manure and fertilizer are applied at rates to meet crop needs and optimize yield (0.15 pt)
- f. Band placement of fertilizer and/or manure near, below and to side of seed row (0.05 pt)

11.2.6. Methane and other air emissions: Which of the following manure management practices do you apply that limit methane production from your manure (1 pt)?

- a. covered manure and flare methane gas (0.2 pt)
- b. compost manure (0.2 pt)

<sup>81</sup> Follows WWF (2015) - F. Pollution, Waste, and Greenhouse Gas Emissions Indicator 55

<sup>82</sup> Follows WWF (2015) - F. Pollution, Waste, and Greenhouse Gas Emissions Indicator 58

<sup>83</sup> Incorporates portions of Unilever Sustainable Agriculture Code, Section 2.3, Nutrient Management (King et al. 2010).

- c. manure additive (0.2 pt)
- d. anaerobic digestion (0.2 pt)
- e. slurry injection (0.2 pt)

11.2.7. Soil carbon: Which of the following cropping practices do you apply that increase soil carbon sequestration (0.4 pt)?

- a. Used cover cropping (0.14 pt)
- b. No-till planting (0.14 pt)
- c. Use manure and/or compost to fertilize cropland, forage crops, and/or pasture (0.7 pt)
- d. Other (list) (0.05 pt): \_\_\_\_\_

11.2.8. Other GHG reduction practices: Have you applied any of the following non-crop practices to your farm (0.4 pt)?<sup>84</sup>

- a. Use feeding and breeding strategies to increase productivity/efficiency or decrease GHG releases (0.2 pt)
- b. Re-forested riparian buffers in last 10 years (0.09 pt)
- c. Converted cropland to permanent pasture or forage in last 10 years (0.09 pt)
- d. Added a permanent conservation easement that excludes development in last 10 years (0.02 pt)
- e. Converted unproductive upland to forest in the last 10 years (0.1 pt)

11.2.9. Air Quality: Dairies can be significant sources of dust and emissions that affect air quality. Which of the following BMPs do you apply to control dust and air emissions (0.2 pt)?

- a. Modifications to diet to reduce dust (0.07 pt)
- b. Landscaping using trees and shrubs to absorb dust and emissions (0.07 pt)
- c. Other (please list): \_\_\_\_\_ (0.06 pt)

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## 11.3 PERFORMANCE INDICATORS

### KEY MANAGEMENT INDICATOR

12.3.1 **Energy, Waste, and GHG Emissions Management**: Which of the following best described the level of energy, waste, and GHG emissions management on your farm (10 pts)?

- a. Risks and impacts of energy costs are annually monitored. Cost effective measures to reduce GHG emissions, waste, and impacts to air quality (can include dust control) are applied. The dairy has had an energy audit within the last five years and has a current, approved nutrient management plan. The farmers knows regulations governing waste and water quality. The farm owners also take proactive actions each year to reduce energy use, solid waste, and/or GHG emissions (10 pts).
- b. Risks and impacts of energy costs are monitored annually. Cost effective measures to reduce GHG emissions, waste, and impacts to air quality (can include dust control) are applied. The dairy has an approved nutrient management plan. The farmer knows regulations governing waste and water quality. Many materials are re-used or recycled (8 pts).

<sup>84</sup> USDA NRCS. 2015. GHG and Carbon Sequestration Ranking Tool (accessed at <http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/air/?cid=stelprdb1044982>).

- c. Risks and impacts of energy costs are monitored most years. No actual adverse impacts from waste have been identified, but no or only minimum measures necessary to prevent adverse waste impacts are applied. Many materials are re-used or recycled (5 pts).
- d. Neither risks nor impacts of energy costs are regularly monitored. Only minimum measures necessary to reduce energy use, solid waste, and/or GHG emissions are applied (2 pts).
- e. Neither risks nor impacts of energy costs are monitored. No measures necessary to reduce energy use, solid waste, and/or GHG emissions are applied (0 pts).

#### 11.3.1. Energy Use:

**a. Energy Intensity:** Energy use / CWT of milk production (FPCM) (KWH/CWT)<sup>85</sup>

**b. Renewable Electrical Energy Use:** Percent of energy used from renewable energy sources = [energy used from renewable energy sources] / [energy used from all energy sources]. If purchased electricity costs, KWH, and location are entered, an estimate of percent of energy used from renewable energy sources will be calculated based on the renewable use profile of the electricity supplier. The farmer will be able to edit the auto-populated estimate using their own data.

#### 11.3.2. Waste:

**a. Waste Intensity:** Tons of waste / CWT of milk production (FPCM) **OR** tons of waste/gross sales.

11.3.3. Greenhouse Gas Emissions: GHG emissions from dairy farming includes N<sub>2</sub>O from soils, fertilizer use and fossil fuels combustion CO<sub>2</sub> and CH<sub>4</sub> from cows, manure, and fossil fuel combustions, each weighted by their global warming potential<sup>86</sup>.

**a. Total GHG Emissions**<sup>87</sup> - If herd size and location are entered, an estimate of total GHG emissions will be estimated. The farmer will be able to edit the auto-populated estimate using their own data and will be encouraged to use Farm Smart<sup>88</sup> or the Cool Farm Tool<sup>89</sup> to estimate GHG emissions.

**b. Greenhouse Gas Emissions Intensity** (tons CO<sub>2</sub>e emissions /CWT milk production) = [sum of CO<sub>2</sub> emitted x 1 + sum of N<sub>2</sub>O emitted x 298 + sum of CH<sub>4</sub> emitted x 25] / CWT of milk production (FPCM)<sup>90</sup>

### 11.4 SUSTAINABILITY INDICATORS

11.4.1. **Greenhouse Gas Emissions:** Ratio of Total Greenhouse Gas Emissions to GHG Emissions allowed based on contribution to GDP. This will be auto-populated and estimated based on herd size. Farmers will be able to modify these estimates based on their own work.

7.4.3. **Management and Disposal of Solid and Hazardous Waste:** When managed and disposed of inappropriately, solid and hazardous waste can pose a threat to public health. Local, state, and federal regulations concerning appropriate management and disposal of solid and hazardous waste can apply to dairy farms. When a farm has had no regulatory actions in the last year OR is compliant with corrective action plans then the dairy is considered sustainable. Which of the following best describes the compliance

<sup>85</sup> Farm Indicator 1.2: Energy Intensity (Innovation Center for U.S. Dairy 2014).

<sup>86</sup> Based on Global Warming Potentials from the IPCC Fourth Assessment Report (2007).

<sup>87</sup> Follows WWF (2015) - F. Pollution, Waste, and Greenhouse Gas Emissions Indicator 57

<sup>88</sup> An online dairy farm GHG emissions calculator create by the Innovation Center for Dairy which can be found at:

<https://farmsmartqa01.usdairy.com/Account/Login?ReturnUrl=%2Fdefault.aspx>

<sup>89</sup> An online farm GHG emissions calculator create by the Cool Farm Alliance which can be found at: <http://www.coolfarmtool.org/>

<sup>90</sup> Farm Indicator 2.2: GHG Intensity (Innovation Center for U.S. Dairy 2014) and similar to Crop greenhouse gas footprint metric

Unilever Sustainable Agriculture Code - Appendix 1.

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of your dairy farm with local, state, and federal regulations concerning appropriate management and disposal of solid and hazardous waste (“c” or better is sustainable)(10 pts)?

- a. Mostly doesn't not meet regulatory compliance
- b. Mostly compliant with regulations OR mostly compliant and undergoing corrective action response (1 pt)
- c. Always compliant with regulations OR currently compliant with and have fulfilled corrective action plans for compliance failures (5 pts)
- d. Always compliant with regulations and mostly exceed regulations (7 pts)
- e. Always compliant with regulations and far exceed regulations(10 pts)

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## TOPIC #12 – WATER

The key water issues for agriculture are its impacts on water availability (principally irrigation) and water quality. Water is used for animal consumption, milk cooling, cleaning and sanitizing equipment, cow cooling, irrigating crops, moving manure and cleaning the barns via flush systems. Agriculture is a major user of water, especially in areas with limited water. Maintaining efficient use of water is important, as it is a resource where availability is becoming more limited in some areas.<sup>91</sup> Dairy agriculture can also pose risks to water quality when poorly managed. Hence, supply chains are concerned about impacts to water supply and quality and how these impacts might limit the availability of dairy products.

### 12.1 AWARENESS INDICATOR

Checking farm water use and potential impacts can help maintain clean supplies of local water.

12.1.1 Do you check for water leaks, water usage, sufficient availability of water, and/or water quality impacts on at least a monthly basis (0.8pt)?

- a. Hardly or not at all (0 pts)
- b. Somewhat (0.2 pt)
- c. Mostly (0.5 pt)
- d. Yes (0.8 pt)

### 12.2 PRACTICE INDICATORS

By applying best management practices and using water efficiently, farmers can reduce costs and the risk of water pollution by systematically managing water resources on the farm.<sup>92</sup>

#### WATER USE (5 PTS)

A reliable, high quality water supply is essential to dairy farms. Although irrigation accounts for much of the water used by agriculture, farms without irrigation can use about 4.5 gallons of water to produce one gallon of milk. Through careful water conservation and management, producers can reduce water and energy costs and ensure the adequacy of their water supplies.

12.2.1. Water Management: What practices do you apply to help ensure farm access to water (2.3 pts)?

- a. Monitor farm water use (0.5 pt)
- b. Assessed use and recharge rates of farm water sources to verify source sustainability (0.5 pt)
- c. Seasonally check and repair water leaks (0.4 pt)<sup>93</sup>
- d. Know your farm water rights (0.2 pt)
- e. Know the stability of farm water from your well and/or your other sources of water (0.3 pt)
- f. Have a plan to meet water needs during drought by reducing use or getting water elsewhere (0.1 pt)
- g. Knowledge of government programs to address drought impacts on farm (0.1 pt)
- h. Evaluate farm for fire risk (0.1 pt)
- i. Participate in a regional or local water management program (0.1 pt)

12.2.2. Water Conservation: Which of the following water use reduction techniques do you apply on your farm (0.2 pt)?

- a. Re-using plate cooler water for livestock watering or other uses (0.07 pt)

<sup>91</sup> Risk Mitigation Best Management Practices for Washington State Dairy Producers (2009)

<sup>92</sup> Risk Mitigation Best Management Practices for Washington State Dairy Producers (2009)

<sup>93</sup> Austin Green Business Leaders Program (2015)



- b. Reduce irrigation of landscaping during drought (0.02 pt)
- c. Recycle or reuse water on you farm (0.1 pt)
- d. have low flow toilets/urinals and aerators on faucets and shower heads (0.01 pt)<sup>94</sup>

**My farm does not use irrigation (2.5 pts) (skip questions 12.2.3 and 12.2.4)**

12.2.3. Irrigation Systems: Which of the following water use reduction techniques do you apply on your farm (select all that apply) (1.5 pt)?

- a. Monitor the timing and application of irrigation water (1 pt)
- b. Water recycling system (0.3 pt)
- c. Have a laser leveled irrigation system (0.2 pt)
- d. Use drip irrigation nozzles (0.2 pt)
- e. Use gated pipe irrigation (0.2 pt)
- f. Use drop nozzle irrigation (0.2 pt)
- g. Enclosed irrigation ditch lines in pipes (0.2 pt)
- h. Converted rill irrigation to more efficient systems (0.2 pt)

12.2.4. Irrigation and Soil Moisture Management: What technique do you use to monitor soil moisture (select one only)? (1 pt)

- a. Irrigation is not monitored or irrigations are on a fixed schedule (0 pt)
- b. Visual inspection (0.5 pt)
- c. Soil moisture is monitored by field moisture sensors or probes (1 pt)

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**WATER QUALITY (5 PTS)**

Nitrogen, phosphorus, and pathogens from dairy farms can pose a risk to water sources used for drinking and to healthy aquatic ecosystems. Water protection measures can improve nutrient use efficiency and reduce costs and risks to reputation while safeguarding water supplies, human health, and aquatic ecosystems.

12.2.5. Water Quality Practices: Which of the following water protection practices have been applied on your farm (select all that apply) (5 pt)?<sup>95</sup>

- a. Understand state and federal regulatory requirements for farms concerning water quality (1 pt)
- b. Riparian buffers of perennial vegetation that are  $\geq 35$  ft. wide (1 pt)
- c. Control of livestock access to water bodies (1 pt)
- d. A nutrient management plan covering for pastures, forage, and crop land (1 pt)
- e. An state-approved integrated pest management plan (0.6 pt)
- e. The risk of sedimentation of water bodies with soil from fields is seasonally assessed and managed (e.g. erosion control, riparian buffer strips, drain design) **OR** sedimentation does not occur on my farm (0.2 pt)
- f. Seasonal scouting for eutrophication (e.g., algae build up, other visual indicators) in water bodies on or downstream to farm (0.2 pt)

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<sup>94</sup> Austin Green Business Leaders Program (2015)

<sup>95</sup> Farm Indicator 3.6: Prevention of Impacts on Water Quality (Innovation Center for U.S. Dairy 2014)

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## 12.3 PERFORMANCE INDICATORS

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### KEY MANAGEMENT INDICATOR

12.3.2 **Water Management:** Which of the following best described the level of water management on your farm (10 pts)?

- a. Risks and impacts on water quality are regularly monitored. Appropriate measures to prevent and mitigate adverse impact to water quality and water availability (e.g., conservation) are applied. The dairy follows a written water management plan that is approved by a state agency or NRCS. The farmer knows regulations governing water quality and water withdrawals. The farmer also takes proactive action to improve water conservation and water quality (10 pts).
- b. Risks and impacts on water quality are regularly monitored. Appropriate measures to prevent and mitigate adverse impact to water availability (e.g., conservation) and water quality are applied (8 pts).
- c. Risks and impacts on water quality are regularly monitored. No actual damage to water quality or water availability is identified, but either no or only minimum measures necessary to prevent adverse impact to improve water availability or water quality are applied (5 pts).
- d. Neither risks nor impacts on water quality are regularly monitored. Only minimum measures necessary to mitigate adverse impact to improve water availability or water quality are applied in response to actual damage (2 pts).
- e. Neither risks nor impacts on water quality are regularly monitored. No measures to mitigate actual damage to improve water availability or water quality and water quality are applied (0 pts).

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### KEY PERFORMANCE INDICATORS

12.3.3 Water Use:

**a. Water Use Intensity:** Water use intensity (gallons/ FPCM CWT)<sup>96</sup>. Water use intensity will be estimated and auto-populated based on herd size and milk production though a farmer will be able to edit auto-populated estimates using other sources of information.

**b. Water Conservation:** Percent of cropped area using the following water conservation strategies:

b.1 Rain water farming: Where crop production is dependent on rain water.

b.2 Dryland farming: A systematic method of growing crops and managing soil moisture in low rainfall areas without irrigation.

b.3 Scheduled irrigation: Scheduled irrigation is where water is only applied when necessary to maintain soil moisture levels necessary for crop production. Soils are monitored to determine when irrigation should occur.

12.3.4 Water Quality:

**a. Water Quality 1:** Water buffers >35 ft. wide along waterbodies (% of water body miles).

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## 12.4 SUSTAINABILITY INDICATORS

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<sup>96</sup> Similar to Farm Indicator 3.2: Water Efficiency (Innovation Center for U.S. Dairy 2014).

12.4.1. **Water Use:** Ratio of Total Farm Water Use to water use allowed based on contribution to GDP at the watershed level<sup>97</sup>. Water use will be estimated and auto-populated based on herd size and milk production though a farmer will be able to edit auto-populated estimates using other sources of information.

12.4.2. **Water Quality:**

**a. Water Quality Regulation Compliance:** Water quality regulations for agriculture were developed to protect public health and aquatic ecosystems. When a dairy has had no regulatory actions in the last year OR is compliant with corrective action plans then the dairy is considered sustainable. Which of the following best describes the compliance of your dairy farm with local, state, and federal regulations concerning water quality, waste management, application of farm chemicals, driving record, and manure and nutrient management (“b” or better is sustainable)?

- a. Mostly doesn't not achieve regulatory compliance
- b. Mostly compliant with regulations OR mostly compliant and undergoing corrective action response (1 pt)
- c. Always compliant with regulations OR currently compliant with and have fulfilled corrective action plans for compliance failures (5 pts)
- d. Always compliant with regulations and mostly exceed regulations (7 pts)
- e. Always compliant with regulations and far exceed regulations(10 pts)

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<sup>97</sup> Similar to Farm Indicator 3.3: Relative Stress on Water Sources by Withdrawal (Innovation Center for U.S. Dairy 2014)  
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