**Supplementary Materials**

**Table 1.** Variables analyzed in the stepwise model and corresponding survey questions.

|  |  |  |
| --- | --- | --- |
| **Variable Type** | **Variable** | **Question** |
| Animals | Breed | What breed predominately makes up your herd? |
| Animal age | What is the average age of a cow in your herd? (years) |
| Culling | On average, what percent of cows are culled from your herd each year? (%)What are the top two most common reasons for culling? |
| Herd size | On average, how many livestock do you have? |
| Milk fed to calves | How long do you feed milk to your calves? (months)How much milk do you feed your calves? (gallons/calf/day) |
| Production per cow | What is your average annual milk production per cow? (lbs/cow) |
| Forage/feed | Acres | How many total acres do you manage? (acres)Of those, how many are owned vs. rented? |
| Forages bought | Do you typically purchase forage?If yes, estimate what percentage of your total forage needs are purchased? |
| Grazing type | What type of grazing do you practice? |
| Perennial/annual forages | How many acres are typically in forage production including pasture, perennial, and annual forages? (acres)Do you typically grow annual forage crops such as sudangrass?If yes, on average how many acres per year? (acres/year) |
| Dry matter intake (DMI) | During the grazing season, what is your average percent dry matter intake (DMI) from pasture? |
| Grazing seasons length | In a typical year, what is the length of your grazing season? (days) |
| Policy | Federal programs (all) | Does your farm participate in any of the following programs? |
| Organic | Is your dairy farm certified organic?If yes, for how many years? |
| Grass fed | How many years has the farm been 100% grassfed? |
|  |
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|

**Table 1 continued.** Variables analyzed in the stepwise model and corresponding survey questions.

|  |  |  |
| --- | --- | --- |
| **Variable Type** | **Variable** | **Question** |
| Management | Inputs | Do you typically purchase fertilizers, manures, or soil amendments? |
| If yes, what do you use? |
| Records and testing | Do you use a service, such as DHIA, to keep herd records? |
| Do you use milk testing services? |
| Milking per day | How many times a day do you milk? |
| Do you feed energy supplements such as molasses or sugar? |
| Supplements | If yes, typically when? |
| What other supplements do you feed? |
| Technology  | How frequently do you use the following for farm business, record keeping, or information? |
| Demographics  | Born Year | What is your age? |
| Sex | What is your sex? |
| Plain community | Do you identify as part of the plain community? |
| Years farming | How many years have you been dairy farming? |
| Succession plan | Do you have a farm succession plan for after you retire? |
| Income from dairy | Estimate the percentage of your total income that each of the following sources provide. |
| Producer knowledge |  | How do you rate your current level of knowledge on the following topics? |
| Information scale |  | How frequently do you use the following as source of dairy information? |

**Table 2.** Producer demographic relationship to milk production – Stepwise model results. Results are considered significant at a *P* ≤ 0.10.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Standard Error** | ***P-*Value** | **95% Confidence Interval** |
| Year born | 5.31 | 25.96 | 0.84 | -46.09 | 56.71 |
| Male | -953.07 | 692.00 | 0.17 | -2,323.42 | 417.29 |
| Plain community | 75.25 | 452.77 | 0.87 | -821.35 | 971.85 |
| Years farming | 6.58 | 19.83 | 0.74 | -32.69 | 45.85 |
| Succession plan | -372.21 | 550.42 | 0.50 | -1,462.19 | 717.76 |
| Dairy income | 6.46 | 10.46 | 0.54 | -14.25 | 27.18 |

**Table 3.** On-farm decision making priorities of plain and non-plain organic, grassfed dairy producers. Factors were ranked on a Likert scale of 1 to 10 with 1 being the most influential and 10 being the least influential. Results are considered significant at a *P* ≤ 0.05.

|  |  |  |  |
| --- | --- | --- | --- |
| **Priority** | **Mean** | **Standard Deviation** | ***P*-value** |
| Autonomy | 5.77 | 2.23 | 0.03 |
| Economics | 5.37 | 2.76 | 0.03 |
| Environment | 5.77 | 2.36 | 0.04 |
| Family, livelihood, and well-being | 5.61 | 3.13 | 0.02 |
| Future generations | 5.82 | 2.71 | 0.16 |
| Labor | 5.78 | 2.18 | 0.87 |
| Policies and regulation | 6.09 | 2.44 | 0.04 |
| Society and community well-being | 6.41 | 2.14 | 0.75 |
| Time management | 5.63 | 2.22 | 0.14 |

**Table 4.** Policy relationship to milk production – Stepwise model results. Results are considered significant at a *P* ≤ 0.10.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Standard Error** | ***P-*Value** | **95% Confidence Interval** |
| Years organic | 32.16 | 33.34 | 0.34 | -33.85 | 98.16 |
| Years grassfed | -42.65 | 58.95 | 0.47 | -159.34 | 74.05 |
| CRP awareness | -174.82 | 268.87 | 0.52 | -707.02 | 357.38 |
| CSP awareness | -53.79 | 239.72 | 0.82 | -528.30 | 420.71 |
| FCIP awareness | -33.26 | 314.11 | 0.92 | -655.02 | 588.50 |
| EQIP awareness | -68.55 | 217.29 | 0.75 | -498.67 | 361.57 |
| MPPD awareness | 150.64 | 208.28 | 0.47 | -261.64 | 562.91 |

**Table 5.** Farm management relationship to milk production – Stepwise model results. Results are considered significant at a *P* ≤ 0.10.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Standard Error** | ***P-*Value** | **95% Confidence Interval** |
| Inputs | 228.47 | 515.24 | 0.66 | -792.42 | 1,249.35 |
| Herd record service | 43.27 | 491.09 | 0.93 | -929.78 | 1,016.32 |
| Milk test | -129.79 | 547.26 | 0.81 | -1,214.12 | 954.53 |
| Twice a day | 1,577.11 | 566.55 | 0.01 | 454.56 | 2,699.66 |
| Energy supplements | 964.74 | 416.03 | 0.02 | 140.43 | 1,789.05 |
| Computer use | -225.55 | 221.68 | 0.31 | -664.78 | 213.68 |
| Email use | 42.79 | 251.52 | 0.87 | -455.57 | 541.15 |
| Internet use | 289.72 | 306.43 | 0.35 | -317.42 | 896.87 |

**Table 6.** Herd characteristics and management relationship to milk production – Stepwise model results. Results are considered significant at a *P* ≤ 0.10.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Standard Error** | ***P-*Value** | **95% Confidence Interval** |
| Crossbred | 1,244.98 | 878.31 | 0.16 | -495.46 | 2,985.41 |
| Holstein | 3,357.36 | 946.58 | 0.001 | 1,481.66 | 5,233.07 |
| Jersey | 784.08 | 970.00 | 0.42 | -1,138.05 | 2,706.20 |
| Cow age | 139.13 | 158.24 | 0.38 | -174.44 | 452.69 |
| Culling rate | 13.14 | 26.83 | 0.63 | -40.03 | 66.31 |
| Number of milk cows | 3.31 | 7.97 | 0.68 | -12.49 | 19.11 |
| Milk fed to calves | 89.52 | 146.09 | 0.54 | -199.96 | 378.99 |

**Table 7.** Relationship of culling with farmer demographics. Data was analyzed using Pearson’s correlation coefficients. Values were considered significant at *P* ≤ 0.05.

|  |  |  |
| --- | --- | --- |
| **Farmer Demographic** | **r value** | ***P-*Value** |
| Age | 0.03 | 0.70 |
| Years farming | 0.13 | 0.09 |
| Number of milking cows | 0.08 | 0.31 |
| Total hectares managed | -0.02 | 0.79 |

**Table 8.** Forage and land characteristics relationship to milk production – Stepwise model results. Results are considered significant at a *P* ≤ 0.10.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Standard Error** | ***P-*Value** | **95% Confidence Interval** |
| Hectares owned | 1.59 | 4.92 | 0.75 | -8.50 | 11.68 |
| Hectares rented | -4.26 | 5.21 | 0.42 | -14.95 | 6.44 |
| Buy forage | 950.49 | 787.04 | 0.24 | -664.38 | 2,565.36 |
| Rotational grazing | -1,374.72 | 895.29 | 0.14 | -3,211.69 | 462.26 |
| Forage production | -1.06 | 5.71 | 0.85 | -12.78 | 10.65 |
| Annual forage hectares/ year | 3.55 | 20.06 | 0.86 | -37.62 | 44.71 |
| Grazing season | -31.11 | 13.14 | 0.03 | -58.07 | -4.15 |
| Dry matter intake (DMI) | -226.82 | 374.74 | 0.55 | -995.72 | 542.09 |

**Table 9.** Producer knowledge relationship to milk production – Stepwise model results. Results are considered significant at a *P* ≤ 0.10.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Standard Error** | ***P-*Value** | **95% Confidence Interval** |
| Body condition scoring | -286.39 | 311.83 | 0.36 | -903.78 | 331.01 |
| Energy requirements | -202.88 | 439.32 | 0.65 | -1,072.71 | 666.94 |
| Farm record keeping | -201.16 | 313.71 | 0.52 | -822.29 | 419.97 |
| Grazing management | -734.08 | 304.35 | 0.02 | -1,336.68 | -131.49 |
| Growing higher energy forages | 215.29 | 404.07 | 0.59 | -584.73 | 1,015.32 |
| Improving forage quality | 503.59 | 453.86 | 0.27 | -395.03 | 1,402.21 |
| Forage yields | -265.14 | 338.23 | 0.44 | -934.81 | 404.52 |
| Reproductive performance | 534.87 | 279.43 | 0.06 | -18.38 | 1,088.12 |
| Forage test results | 132.60 | 301.83 | 0.66 | -464.99 | 730.19 |
| Milk urea nitrogen (MUN)  | 404.14 | 312.34 | 0.19 | -214.26 | 1,022.54 |
| Soil test results | 3.80 | 283.34 | 0.99 | -557.19 | 564.79 |
| Maximize forage DMI | 81.61 | 334.84 | 0.81 | -581.35 | 744.58 |
| Forage production costs | 184.51 | 326.65 | 0.57 | -462.23 | 831.24 |

**Table 10.** Producer responses to the question “How do you feel you are doing with…?” regarding various management parameters. Responses were based on a scale of very unsatisfied to very satisfied. Data was analyzed using Pearson’s correlation coefficients. Values were considered significant at *P* ≤ 0.05.

|  |  |  |
| --- | --- | --- |
| **Management parameter** | **r value** | ***P-*Value** |
| Pasture quality and yield | -0.19 | 0.01 |
| Stored forage yield | -0.25 | 0.003 |
| Stored forage quality | -0.24 | 0.003 |
| Soil fertility / health | -0.13 | 0.10 |
| Cow body condition | -0.13 | 0.10 |
| Milk production | -0.22 | 0.005 |
| Reproduction and calving | -0.16 | 0.04 |
| Herd health | -0.20 | 0.01 |
| Quality of young stock | -0.10 | 0.20 |
| Farm income | -0.11 | 0.19 |

**Table 11.** Farmer information scale relationship to milk production – Stepwise model results. Results are considered significant at a *P* ≤ 0.10.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Standard Error** | ***P-*Value** | **95% Confidence Interval** |
| Information scale | 1,218.97 | 309.17 | 0.00 | 608.09 | 1,829.86 |

**Figure 1.** Representation of states from producer respondents.

