USDA – NRCS Energy Estimation Tools

Online Energy Estimator

Rusle 2
Online Energy Estimator

Website
http://energytools.sc.egov.usda.gov/

- Animal Housing
- Irrigation
- Tillage
- Nitrogen
Energy Estimator: Irrigation

Welcome to Energy Estimator: Irrigation

Energy Estimator for Irrigation is the third of several tools from Natural Resources Conservation Service (NRCS) developed to increase energy awareness in agriculture. This NRCS energy consumption tool enables you to estimate energy cost of pumping water in the irrigation operations on your farm or ranch. NRCS technical specialists have developed these cost estimates based on irrigation methods for predominant crops in your state. This tool does not provide field-specific recommendations. It evaluates options based on user input.

Step 1: Zip Code

To use this tool, begin by entering your zip code, then click.

Zip Code: 

* Required Input

Last Modified: 06/20/2020
Energy Estimator: Tillage
Energy Estimator: Animal Housing

Welcome to Energy Estimator: Animal Housing

Energy Estimator: Animal Housing is the fourth tool in the suite of awareness tools the Natural Resources Conservation Service (NRCS) has developed to increase energy awareness in agriculture.

The NRCS energy awareness tool is designed to inform you of the energy cost centers and help you estimate the energy costs for these animal housing operations on your farm or ranch. NRCS technical specialists have developed energy cost models for housing dairy cows, swine, and poultry.

The tool does not provide operation-specific recommendations; it provides an idea of the type of energy cost savings that a producer might expect from making simple changes to the operation. Results should not be construed as actual savings, but only as estimates. The tool evaluates options based on user input.

To start enter your zip code and select an animal type, then click Continue.

Step 1: Zip Code and Animal Type

To use this tool, begin by entering your zip code and selecting an animal type, then click Continue.

Zip code: *

Animal Type: *

Select Animal Type

Continue

Last Modified: 09/11/2009

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Animal Housing Example

Welcome to Energy Estimator: Animal Housing

This tool does not provide operation-specific recommendations; it provides an idea of the type of energy cost savings that a producer might expect from making simple changes to the operation. Results should not be construed as actual savings, but only as estimates. The tool evaluates options based on user input.

Step 1: Zip Code and Animal Type

To use this tool, begin by entering your zip code and selecting an animal type, then click Continue.

- Zip code: * 08802
- Animal Type: * Dairy Cows

* Required Input
Step 2: Dairy Cow Housing Systems

The NRCS technical specialists have developed the Energy Estimator: Animal Housing to provide you with energy use and cost estimates for your dairy operation. The estimates will report on the major energy costs found in a typical dairy. The tool considers lighting, air circulation, milk cooling, water heating, and milk harvesting costs. Characterize the size of your dairy and provide some information on energy/fuel sources you use in your dairy operation, then click next.

**Herd and Milk Production**

- Specify total number of confined cows: 85
- Specify total annual milk production: 1360000 lbs

**Electricity Cost**

- Enter your electricity unit cost: $0.15/kWh

* Required Input
Step 3: Characterize Your Housing Systems

Provide information about your lighting, air circulation and milking systems that apply to the dairy operations on your farm.

**Housing Systems**

**Lighting**
- Select Lighting Type: Incandescent
- Do you use Long-Day Lighting in your barns? Yes/No

**Air Circulation**
- Do you use circulation fans in your barn? Yes/No
- Do you keep your barn fans clean and maintained? Yes/No
- Do you use circulation fans in your milking parlor? Yes/No
- Do you keep your parlor fans clean and maintained? Yes/No

**Milking Operations**

**Milk Cooling**
- Select Your Milk Pre-Cooling System: Water-Cooled Plate Cooler
- Do you use a scroll compressor? Yes/No

**Water Heating**
- Select Fuel Type: Electricity
- Unit your fuel unit cost: \$0.15 per kWh
- Do you pre-heat your water using recovered compressor heat? Yes/No
- Milk Harvest: Do you use a Variable Frequency Drive on your vacuum pump? Yes/No

* Required Input
Step 4: Dairy Cow Housing System Analysis

The table below indicates your Dairy Housing energy use and cost estimates along with our projected use and costs after recommended modifications have been implemented to improve efficiency. This tool does not provide site-specific recommendations. It evaluates alternatives based on your input. Changes in energy use and costs are reported as differences from your current system configuration based on your responses on the previous pages.

<table>
<thead>
<tr>
<th>State</th>
<th>New Jersey</th>
<th>Town</th>
<th>Asbury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Operation</td>
<td>Dairy</td>
<td>Number of confined Cows</td>
<td>85</td>
</tr>
<tr>
<td>Annual Milk Production</td>
<td>1,360,000 lbs</td>
<td>Lighting</td>
<td>Incandescent</td>
</tr>
<tr>
<td>Air Circulation</td>
<td>Barn Yes</td>
<td>Milk Cooling</td>
<td>Water-Cooled Plate Cooler</td>
</tr>
<tr>
<td>Water Heating</td>
<td>Electricity</td>
<td>Milk Harvesting</td>
<td>VFD No</td>
</tr>
</tbody>
</table>

### Annual Dairy Cattle Housing System Analysis

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimated Annual Energy Use (kWh)</th>
<th>Estimated Annual Energy Cost ($)</th>
<th>Estimated Annual Energy Savings ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lighting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your Lighting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change to T8 *</td>
<td>11,700 kWh</td>
<td>$1,755</td>
<td>$1,755</td>
</tr>
<tr>
<td>Change to Compact Fluorescent *</td>
<td>2,000 kWh</td>
<td>$300</td>
<td>$1,455</td>
</tr>
<tr>
<td>Change to High Pressure Sodium</td>
<td>2,900 kWh</td>
<td>$425</td>
<td>$1,220</td>
</tr>
<tr>
<td>Change to Halide *</td>
<td>3,300 kWh</td>
<td>$495</td>
<td>$1,260</td>
</tr>
<tr>
<td>Change to Mercury Vapor *</td>
<td>3,500 kWh</td>
<td>$525</td>
<td>$1,230</td>
</tr>
<tr>
<td>Change to Halogen</td>
<td>6,800 kWh</td>
<td>$1,020</td>
<td>$575</td>
</tr>
<tr>
<td>Air Circulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your Freestall Barn</td>
<td>11,700 kWh</td>
<td>$1,755</td>
<td>$1,755</td>
</tr>
<tr>
<td>Clean and maintain circulation fans</td>
<td>7,000 kWh</td>
<td>$1,050</td>
<td>$705</td>
</tr>
<tr>
<td>Milking Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your Milk Cooling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add VFD and Scroll Compressor</td>
<td>9,500 kWh</td>
<td>$1,425</td>
<td>$1,425</td>
</tr>
<tr>
<td>Add VFD</td>
<td>6,700 kWh</td>
<td>$1,005</td>
<td>$420</td>
</tr>
<tr>
<td>Add Scroll Compressor</td>
<td>7,900 kWh</td>
<td>$1,185</td>
<td>$240</td>
</tr>
<tr>
<td>Your Water Heating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-heat water using recovered compressor heat</td>
<td>13,600 kWh</td>
<td>$2,040</td>
<td>$2,040</td>
</tr>
<tr>
<td>Your Milk Harvest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use a Variable Frequency</td>
<td>10,900 kWh</td>
<td>$1,635</td>
<td>$1,635</td>
</tr>
</tbody>
</table>
Rusle 2 Fuel Use Calculator

Website:
http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm

Fuel: Diesel

Cost/gallon: $2.75

Corn grain, chisel twisted, disk
4.1 gal/ac; 570,000BTU/ac; $11.36/ac

Corn grain, disk-plant
3.0 gal/ac; 420,000BTU/ac; $9.09/ac

Corn grain, no-till
2.2 gal/ac; 310,000 BTU/ac; $6.60/ac