This presentation centers on some of the main management principles important in raising healthy dairy replacement heifers from birth to 6 months of age. There will also be a discussion pointing out standard protocols used during research trials at the Southern Research and Outreach Center in Waseca, MN.
It is important to get calves off to a good healthy start. This graph from the National Animal Health Monitoring System, USDA, shows how high the death rate in calves is during the first week and second week of life. Calf deaths losses decrease rapidly after that throughout the rest of the pre-weaning growth stage. However, the death rate increases again in the 9th week as many farms wean calves and move them to group pens.
Raising Healthy Dairy Heifer Calves

• It’s a challenging job.

• Preventing disease gets them off to a good start, reduces death losses, and is cheaper than treating sick animals.

• Even if a calf survives a disease or sickness, its potential for reaching proper weight at the proper time for calving and being successful in the dairy herd is going to be uncertain.

Raising calves on any farm and in any housing system is a challenging job. The important point in getting calves off to a good start is not only to reduce death losses, but to keep them healthy. Preventing disease is cheaper than treating sick animals. Even if a calf survives disease or sickness, there more than likely will be an economic impact because of the uncertainty of the calf reaching its potential for proper weight at the proper time for calving and make a successful contribution in the dairy herd.
5 Keys to Your Success

1. Calf Immunity
2. Biosecurity (Disease Prevention)
3. Calf Comfort
4. Focus on what is MOST important to you … then measure it
5. Maximize Your Resources

As we go through this presentation, keep in mind 5 keys to your success in raising healthy calves. They are as follows:
There is an on-going battle in managing disease on the calf operation. On one side of the scale is immunity, or the ability of the calf to fight off disease. On the other side is the pathogen load, or the number of disease-causing bacteria and viruses presented to the calf. The lower the pathogen load on the right, the higher goes the ability to fight off disease on the left side.
The calf is born essentially devoid of antibodies and therefore, it is critical that colostrum be as bacteria free as possible to prevent scours, transmission of Johne’s disease and other disease causing organisms. Bacteria can also block immunoglobulin absorption across the intestine. Only during the calf’s first 24 hours can it absorb whole antibodies through its small intestine wall. These antibodies circulate in the animal's bloodstream to help fight off diseases and infections during the first few weeks of life.
## Costs of raising dairy heifers by stage of growth

<table>
<thead>
<tr>
<th>Costs</th>
<th>Stage of Growth</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Birth to 200 lbs</td>
<td>200 to 700 lbs</td>
<td>700 to 800 lbs</td>
<td>800 lbs to calving</td>
</tr>
<tr>
<td>Feed</td>
<td>$71.75</td>
<td>$210.75</td>
<td>$75.05</td>
<td>$343.13</td>
</tr>
<tr>
<td>Labor</td>
<td>$72.31</td>
<td>$75.93</td>
<td>$25.27</td>
<td>$78.23</td>
</tr>
<tr>
<td>All other</td>
<td>$55.16</td>
<td>$119.22</td>
<td>$55.19</td>
<td>$227.23</td>
</tr>
<tr>
<td>Total</td>
<td>$199.22</td>
<td>$405.91</td>
<td>$155.51</td>
<td>$648.59</td>
</tr>
<tr>
<td>% of total</td>
<td>14%</td>
<td>29%</td>
<td>11%</td>
<td>46%</td>
</tr>
<tr>
<td>% of growth</td>
<td>8%</td>
<td>38%</td>
<td>12%</td>
<td>35%</td>
</tr>
</tbody>
</table>

*Adapted from Karszes, Cornell (2005)*

Feed prices have varied a lot in recent years so this table should not be seen as the true cost to raise heifers during any growth stage. However, more than likely, the percentage of total cost for each stage of growth shown is probably pretty close. Note the percent of the cost to raise a heifer from birth to 200 lbs (14%) vs the percent from 200 lbs to 700 lbs (29%). The cost to get new born calves off to a good start should not be compromised as that is not the high cost period of raising replacements.
How big should a heifer be at breeding? At calving?

Here are some targets to shoot for in your calf management practices to know if you are on the right growth track to raising a heifer. At puberty the calf should be around 45-50% of its expected mature body size. At breeding, it should be around 55% of mature body size. At first calving, at 82%, at second calving, at 92% and by the 3rd calving at 100%. The next two slides will help determine the approximate weights for each stage based on the dairy breed.
This table shows commonly used standards for weight and height goals for growing heifers up to 24 months of age, by breed.
The Bovine Alliance on Management and Nutrition developed a system to help determine growth targets for heifers. The first step is to determine the mature body weight of cows using the previous slide. Step 2 is to multiply the weight determined in step 1 and multiply by 0.82 to find the target weight after first calving. Step 3 is to set the target weight at calving age. Multiply the mature weight by 0.55 to determine the target weight at breeding, then set target age at breeding. Then finally, you can develop a nutrition and management program to achieve those desired targets for breeding age and weight.
The “ABCDEFGs” for Healthy Calves

Attention to detail
Bedding
Cleanliness
Dry
Environment
Feeding utensils
Growth success

What does it take to raise healthy calves, all the time? The following slides provide some management principles to help meet that goal. We call them the ABCDEFG’S for healthy calves.
Attention to Detail

- **Colostrum.** Must feed high quality colostrum ASAP. Highest absorption is within first 4 hours. Feed 4 quarts of >5g/deciliter.
- **Consistency.** Protocols must be developed and followed
- **Vaccination program.** Evaluate to prevent dependence on vaccination.
- **Water.** Fresh, clean, easily accessible, available at least 2x/day.
- **Biosecurity.** Control/monitor all livestock, equipment, and people entering.
- **Calving Area.** Use individual maternity pens.
- **Calf temperature.** Use a rectal thermometer regularly.
- **Designated Worker.** Daily calf chores by the same person(s).
- **Calf stress.** Any changes in routine will stress calves.
- **Isolation.** Keep calves separated to prevent physical contact.

‘A’ is for paying Attention to detail. So much of good management is in the details of how tasks and practices are handled every day for every calf. These details include:
Bedding

Dirty calves can become sick calves.
• Bedding should always be replaced between calves.
• Remove soiled bedding from pens and add fresh bedding as often as necessary to maintain a clean, dry bed.
• Clean, wash, disinfect and dry out individual hutches, stalls or pens between calves.

‘B’ for Bedding. Bedding needs to be kept clean and dry, or it needs to be replaced. Dirty calves can become sick calves. Bedding should always be replaced when moving a calf out of the pen and replaced with a new calf. Hutches, stalls and pens should be cleaned, washed, disinfected and allowed to dry between calves.
‘C’ is for **Cleanliness.** All feed and water made available to calves should always be clean, and the maternity pen should be clean, sanitary and freshly bedded. The calf should be removed immediately from the maternity pen after it is born as this can help prevent the spread of Johne’s disease by keeping the calf from ingesting contaminated feces or colostrums.
Dry

Calves are more comfortable and healthier when dry.

- Dryness lessens virus and bacteria growth.
- Rub calf dry when it is born with a clean, sanitary cloth or towel.
- Constantly check the bedding to see if it is wet. Get down with calf to investigate.
- Design hutches and locate for good drainage of water and urine, inside and outside.

Continuing our way through the ABCDEFG’s for healthy calves, ‘D’ is for Dry. Calves are much more comfortable and healthier when they are dry. There is less virus and bacteria growth. When the calf is born, it should be rubbed dry with a clean, sanitary cloth or towel. It is important to keep checking the bedding for wetness, even if you need to get down on your knee to investigate. If using hutches, they should be designed and located where there is good drainage of water and urine, both inside and outside the hutch.
‘E’ is for Environment. One of the biggest causes of calf illness, especially in an enclosed facility, is the environment in which the calf is placed. There needs to be adequate ventilation. Use switches, thermostats and timers to keep the inside environment as consistent as possible and provides fresh air and proper air exchanges per hour. However, drafts on the calves need to be prevented and the humidity must be controlled. The most comfortable temperature for calves is between 50-85 F and the optimal relative humidity should be around 65-75%.
Environment

*Adequate ventilation --*

**Mechanical Ventilation Rates**
Ventilation needs increase as animal age and temperatures rise.

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Cold*</th>
<th>Mild</th>
<th>Hot**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calves 0-2</td>
<td>15</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Heifers 2-12</td>
<td>20</td>
<td>60</td>
<td>130</td>
</tr>
<tr>
<td>Heifers 12-24</td>
<td>30</td>
<td>80</td>
<td>180</td>
</tr>
</tbody>
</table>

*Alternate recommendation = 4 air changes/hr  
**Alternate recommendation = 40 air changes/hr

To be more specific on ventilation, here are the recommendations for the amount of cubic feet per minute per animal needed for the various age groups of calves. Ventilation needs do increase as the animal age and temperatures rise.
If animals are out in a pasture or lot, providing shade and having access to shade is a good management practice as heat stressed calves and heifers will go off feed. In order to prevent shaded areas from becoming manure-laden and a disease breeding ground, enough square footage of shade should be provided for all calves and heifers.
Calves and heifers that are housed in a pen or a lot need to have adequate space for eating, drinking and resting. This table shows the resting area space requirements per animal based on size and/or age with four alternative housing systems.
This table shows the minimum bunk space requirements per animal based on age with feed always available or all animals eating at once.

<table>
<thead>
<tr>
<th>Type</th>
<th>3-4</th>
<th>5-8</th>
<th>9-12</th>
<th>13-15</th>
<th>16-24</th>
<th>Mature Cow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed always available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hay or silage</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Mixed ration or grain</td>
<td>12</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>All animals eat at once</td>
<td>12</td>
<td>18</td>
<td>22</td>
<td>26</td>
<td>26</td>
<td>26:30</td>
</tr>
<tr>
<td>Hay, silage, or ration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environment

Housing –

- Large-group pen housing increases the odds of more respiratory disease, increases the odds of diarrhea and increases its severity.
- Prevent older and younger calves from physical contact.
- Best to have calf facilities completely separate from other animal facilities.

Large-group pens increases the odds of more respiratory disease, increases the odds and severity of diarrhea. A standard management practice should be to prevent older and younger calves from any physical contact. It is also advised to have calf facilities separate from other animal facilities.
A housing system for calves and heifers should have convenient manure removal and good access to bedding supplies. After all, cleanliness is a high priority. Post-weaned calves should be grouped together by age and size with 3 to 5 animals per group. Then, at about 4 months of age, groups of 6 to 12 calves are acceptable.
Hutches

- Locate far enough apart to prohibit intermingling of calves.
- Design to keep calves dry, protected from environmental conditions.
- Calf manager needs to have ease of cleaning and sanitation, ability for good observation and access.

*Super calf hutches are great after weaning*

Hutches should be located far enough apart to prohibit calves from touching one another. Hutches should be designed to keep calves dry and protected from extreme or uncomfortable environmental conditions. Hutches should be constructed and placed for ease of cleaning and sanitation, and so the calf manager has the ability for good observation and access. Super calf hutches, such as the one shown on the right, are great for calves after weaning.
Greenhouses that are well managed can work well in raising calves. However, it takes good management because proper temperature and air quality must be maintained throughout the day and night, year around. It is important that the calf manager monitor the condition inside the greenhouse at various times of the day as temperatures can change dramatically from early morning to noon to mid-afternoon to night fall. During rainy weather, make sure the pens are away from the sidewalls if there is a chance that blowing rain could enter the pen.
**Feeding Utensils**

- *Time* must be allowed for washing and sanitizing the calf feeding equipment.

- A good wash-up job means clean, wholesome and nutritious feed and healthy calves.

- If nipples or buckets are shared by multiple calves during a feeding, they must be disinfected between calves.

Now we come to the ‘F’ which stands for Feeding Utensils. Any individual that is feeding calves must take the time to wash and sanitize the calf feeding equipment after every feeding. A good wash-up job of feeding utensils will help immeasurably to be able to offer clean, wholesome and nutritious feed to calves and keep them healthy. If nipples or buckets are shared by multiple calves during a feeding, they must be disinfected between calves to prevent the spread of bacteria from one calf to the next.
**Feeding Utensils**

**Cleaning and Sanitizing:**

- Rinse containers with lukewarm water.
- Then, use $+120^\circ$ F water with chlorine and soap.
- Dump nipples into the solution. Fill the bottles with it.
- Use a wash acid.
- Sanitize balling guns and stomach tubes, which go into the calf’s mouth.
- Make sure boots, hand tools, skid steers and any other equipment are clean.

This slide shows a good cleaning and sanitizing protocol for nipples, balling guns, stomach tubes. Also, make sure boots, hand tools, skid steers and any other equipment are clean to prevent the spread of bacteria from one animal to the next and from one pen to the next or from one building to the next.
Feeding Utensils

- After cleaning and sanitizing, allow containers, nipples, balling guns, stomach tubes to completely dry.
- Avoid stacking pails inside each other until completely dry.

After containers, nipples, balling guns and stomach tubes have been cleaned and sanitized, allow them to completely dry before using again. Avoid stacking pails inside each other otherwise they may not completely dry.
Growth Rates

Success of calf raising --

• % survival and growth rates.

• Growth rate affects the timing of puberty, age of first freshening, and even first lactation milk production.

Successful calf raising can be measured by how healthy calves are, what the percent survival rate is in the calf operation and what the growth rate is for each animal. ‘G’ is for Growth rate. Growth rate affects the timing of puberty, the age of first freshening and even affects first lactation milk production.
Growth

- **Weighing** -- use scale or tape
- **Check height** -- use altimeter stick with parallel level bar
- Calculate ADG
- Heifer target growth curves available by breed.

Growth should be monitored periodically by weighing the animal, either using a scale or tape, and by checking the hip height using an altimeter stick with a parallel level bar. Average daily gains can be calculated and written down to keep track of how a number of the heifers are doing from time to time. There are growth curves available by breed which can be used to see if your heifers are on target.
Data that is collected can be entered into a computer program which, over time, will show the growth chart of an individual animal. This allows the opportunity to evaluate progress and to see if the heifers are on target to meet the goals set by the owner.
At the University of Minnesota Southern Research and Outreach Center in Waseca facilities that opened in April, 2004 are used to conduct applied research on calves from birth to six months of age. In the foreground of the photo, the first two barns are the calf nurseries and directly behind them is a grower barn for the calves when they reach 8-10 weeks of age until they leave Waseca.
A partnership was formed to construct the three barns and to conduct dairy calf research. The research focuses on applied nutrition and management for replacement heifers from birth to 6 months of age. The central goal in the Center’s research efforts is “developing tomorrow’s dairy cow.”
Calf and Heifer Research and Extension Facility

- Two 30 ft x 200 ft calf barns
- 40 calves/room all-in/all-out
- 160 individual pens (birth to 10 weeks of-age)

The first two barns in the photo are 30 ft x 200 ft nurseries. Each barn is divided into two 40 calf rooms with individual pens.
Calf management before arrival at SROC at 2-4 days of-age:

- Getting calves off to a good start = feeding colostrum
- Prior to pick-up all calves will have received at least 3 feedings of high quality colostrum, navel dipped twice, ear tagged and administered an agreed health program protocol.
- Unthrifty calves will be not sent.
Calves are picked up from the three cooperating commercial dairy operations that supply heifer calves to SROC.
When calves arrive, they are put into individual pens.
Calves are weighed, measured for hip height when they arrive. While on a trial the unused feed from every calf is weighed back to determine the actual amount of feed consumed.
This is the work room, wash area, and storage area that is located between a calf barn wing on the left and on the right.
When calves all leave one wing of a calf barn, the individual pen panels are removed, cleaned and sanitized. Manure and bedding is removed from the floor.
A new bedding base is added once the pens are cleaned
Panels are washed outside the calf barn.
Post weaning group housing

- 65 ft x 150 ft grower barn -- 9 to 27 weeks of age
- 120 head in 20 pens

At 8 weeks of age, 2 weeks after weaning, calves are moved to the grower barn and placed in group pens.
A view of the Grower Barn at SROC where 120 post-weaned calves are grouped 6/pen in 20 pens.
Weight scales in the grower barn makes it convenient for monitoring growth of the heifer calf.
Second post weaned group barn – 20 pens of 6 heifers/pen – studies rotated with new barn

A older shed at SROC is also used as a grower barn.
**SROC vaccination protocol:**

**Upon arrival at 2-4 days of-age:**
- Intranasal – modified live for IBR/PI3 (TSV2) 2ml in each nostril
- *Salmonella (S) Newport* SRP vaccine 2 ml sc – SRP technology by AgriLabs (proteins - siderophore receptors and porins from cell walls of gram negative bacteria salmonella – efficacy for *S. dublin* as well)

**2 weeks and 6 weeks after arrival:**
- IBR, BVD (Types 1 & 2), PI3, BRSV (Bovishield gold 5 – 2 ml i.m.in neck)
- SRP 2 ml dose sc.

Vaccination protocol at SROC
**SROC vaccination protocol (cont’d)**

**Other calf barn protocols:**
- Dehorning and tail docking (if requested) at approx 30 days after arrival
- Prior to moving to groups pens TSV2.

**Group pens: 4 and 5 months after arrival:**
- Leptospira serovar hardjo-bovis and borgpetersenii (Spirovac L5- 2 ml sc)
- Clostridium species (Ultrabac 7 – 5 ml sc)
- LA-200 antibiotic 5 ml/100lb BW with Spirovac at 4 months only.
Standard Feeding Protocol

- Starts with a strong healthy calf.

- Standard control program –
  - 20:20 medicated all-milk protein milk replacer fed at 1.25 lb/day for 35 days, then
  - 0.625 lb/day from day 36 to weaning at 42 days (12.5% solids).

- A texturized 18% calf starter is offered free choice plus fresh water

Standard feeding program and protocol at SROC
Reduce Potential Calf Stressors:

- Dehorning
- Vaccinations
- Tail docking
- Socialization / grouping
- Feed changes
- Environmental changes

Adapted from Hayes, SROC workshop 2006

There are a number of stressors that can affect calf growth and development if not managed properly. One good management practice is to limit the stressors to as few as possible at any one time. Spread out the tasks that need to be done and changes that need to be made.
A. Upon arrival

<table>
<thead>
<tr>
<th></th>
<th>Farm A</th>
<th>Farm B</th>
<th>Farm C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3456 calves</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of heifers</td>
<td>885</td>
<td>1,593</td>
<td>978</td>
</tr>
<tr>
<td>Initial BW. lb</td>
<td>88.8</td>
<td>86.7</td>
<td>87.2</td>
</tr>
<tr>
<td>Initial serum protein, g/dl</td>
<td>5.4</td>
<td>5.4</td>
<td>5.2</td>
</tr>
</tbody>
</table>

**Initial serum protein profiles:**

<table>
<thead>
<tr>
<th>Serum Protein, g/dl</th>
<th>&lt; 4.0 g/dl, %</th>
<th>4.0-4.5 g/dl, %</th>
<th>4.6-5.0 g/dl, %</th>
<th>5.1-5.5 g/dl, %</th>
<th>5.6-6.0 g/dl, %</th>
<th>&gt; 6.0 g/dl, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.9</td>
<td>8.2</td>
<td>22.8</td>
<td>24.8</td>
<td>28.5</td>
<td>14.8</td>
</tr>
<tr>
<td></td>
<td>2.7</td>
<td>12.2</td>
<td>22.5</td>
<td>20.5</td>
<td>22.8</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>1.3</td>
<td>13.7</td>
<td>33.2</td>
<td>23.4</td>
<td>20.7</td>
<td>7.7</td>
</tr>
</tbody>
</table>

- Heifers 5 or < g/dl = 39.2%; Heifers 5.1 or > 60.2%
- Goal of working with cooperating dairies -- to improve SP profiles.

A quick look at the serum protein data based on 3456 calves that arrived at SROC. Serum protein levels are checked on every calf at time of arrival at SROC.
### B. 6 month profile of 2,397 heifers

<table>
<thead>
<tr>
<th></th>
<th>Farm A</th>
<th>Farm B</th>
<th>Farm C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final BW, lb</td>
<td>476</td>
<td>462</td>
<td>451</td>
</tr>
<tr>
<td>Final Hip Height, in</td>
<td>45.5</td>
<td>44.9</td>
<td>45.1</td>
</tr>
<tr>
<td>Total ADG, lb</td>
<td>1.92</td>
<td>1.91</td>
<td>1.91</td>
</tr>
</tbody>
</table>

Body weights, hip heights and average daily gain on 2397 heifer calves at 6 months of age at SROC. The calves come from three commercial dairy farms.
All calves that arrive at SROC are being tracked from birth through the end of their first lactation back at the home farm using spreadsheets containing a number of sets of data.
Three commercial dairy farms supply dairy heifer calves to SROC. These are the serum protein test results, weights and heights for just 375 calves the day they arrived at SROC from one of the three farms, then the 6 month weights and hip heights when they left SROC, and the 305 Mature Equivalent milk level after those calves completed their first lactation.
### Farm B

<table>
<thead>
<tr>
<th>SP range</th>
<th>% in</th>
<th>No.</th>
<th>Initial BW</th>
<th>Serum Prot.</th>
<th>Final BW</th>
<th>HH</th>
<th>ADG</th>
<th>Final 305 ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4.0</td>
<td>7.6</td>
<td>16</td>
<td>90.4</td>
<td>3.9</td>
<td>483</td>
<td>45.45</td>
<td>2.01</td>
<td>27258</td>
</tr>
<tr>
<td>4.1-4.5</td>
<td>8.6</td>
<td>18</td>
<td>88.4</td>
<td>4.2</td>
<td>472</td>
<td>44.93</td>
<td>1.96</td>
<td>26463</td>
</tr>
<tr>
<td>4.6-5.0</td>
<td>38.3</td>
<td>80</td>
<td>87.8</td>
<td>4.9</td>
<td>471</td>
<td>45.33</td>
<td>1.95</td>
<td>27137</td>
</tr>
<tr>
<td>5.1-5.5</td>
<td>22.5</td>
<td>47</td>
<td>88.2</td>
<td>5.3</td>
<td>467</td>
<td>44.96</td>
<td>1.93</td>
<td>27043</td>
</tr>
<tr>
<td>5.6-6.0</td>
<td>15.4</td>
<td>32</td>
<td>88.1</td>
<td>5.8</td>
<td>486</td>
<td>45.59</td>
<td>2.01</td>
<td>28024</td>
</tr>
<tr>
<td>&gt;6.0</td>
<td>7.6</td>
<td>16</td>
<td>84.1</td>
<td>6.6</td>
<td>457</td>
<td>44.55</td>
<td>1.89</td>
<td>25614</td>
</tr>
</tbody>
</table>

**Results of 209 calves from Farm B that have completed their first lactation.**
Results of 279 calves from Farm C that have completed their first lactation.
Summary:

- SROC applied research programs have investigated options to support an improvement in the consistency of nutritional management for commercial dairy heifers from 2-4 days up to 6 months of age.

- Following the heifers back to their respective dairies to monitor first lactation performance allows a complete systems approach to establish a relationship between calf health and performance up to 6 months of age to first lactation milk production parameters.

Dairy calf research at SROC has investigated nutritional management options since 2004 for calves up to six months of age. Following the calves through their first lactation provides the opportunity to analyze relationships between calf health, performance and first lactation milk production parameters.
Cost of Raising Replacement Dairy Heifers

- Print Menu
- Summary
- Feed
- Labor
- Breeding
- Health
- Buildings
- Equipment
- Mortality
- Interest
- Manure

This takes you to a page where you can choose to print some or all of the sheets.
This worksheet calculates the feed costs to raise a heifer up through various age classes.
This worksheet calculates the labor costs to raise a heifer up through various age classes.
This worksheet calculates the cost of breeding a heifer either by AI or bull service.
This worksheet calculates the building costs for a heifer through various age classes.
This worksheet calculates the health costs to raise a heifer up through various age classes.
This worksheet calculates the building and housing costs for a heifer through various age classes.
This worksheet calculates the equipment costs for a heifer through various age classes.
This worksheet calculates the mortality costs for a heifer through various age classes.
This worksheet calculates the interest or opportunity cost of ownership for a heifer through various age classes.
This worksheet calculates the manure storage and spreading costs for a heifer through various age classes.

Summarises all the individual sheets and allows you to see costs of each input and the cost/day to raise a heifer.

Heifer growers need to know the cost of raising their replacements. This is a copy of a interactive worksheet from Penn State to help make those important calculations.