Frame Size and Market-Ready Weights

Cindy A. Kinder, Extension Educator

Goal (learning objective)
Youth will learn the differences in frame sizes and market-ready weights for individual animals.

Supplies
- Project animals with different frame sizes
- Handouts 1-6, Planning & Record Sheets and Frame Score Charts for each species, enough copies for the group
- Copy of the feeding period minimum requirements for project animals. Idaho 4-H minimum feed periods are 130 days for beef, 80 days for swine, 60 days for sheep and goats
- Pencils

Pre-lesson preparation
- Review and make copies of all of the handouts

Lesson directions and outline
Background information
This is would be helpful to share with youth prior to them selecting market animal projects for the year. Members should be familiar with animal industry standards, fair weight requirements and project feeding periods. Older youth could be asked to discuss experiences they have had with frame size and market ready weights while raising project animals.

Frame size is determined by age and hip height for beef, wither height for sheep and goats. For swine, body length and the size of the cannon bone. Refer to the frame score charts for each species. Frame size will determine an individual animal’s market-ready weight.

Introduction
Explain to the group that within each species (beef, sheep, swine and goats) there are animals with small, medium, and large frames. Each breed of animal within a species has a typical frame size. However, there may be multiple frame sizes within a breed.

Conducting the activity (DO)
1. Review the frame score chart for the species you are leading to help the youth determine frame size of their animal and potential market ready weight.
2. Have the youth circle the projected market weight of their project animal on the species frame score chart.
3. At time of purchase or at the beginning of the project, fill out the beginning planning & record sheet to estimate the market-ready weight of each project animal and its average daily gain.

For Level 2 and 3 complete the remainder of the beginning planning and record sheet
4. Determine the resources you have by listing the types of feeds you are using.
5. Describe the method of feeding.
6. Complete the remaining planning & record sheet.

What did we learn? (REFLECT)
- Ask: What did you learn about frame size?
- Ask: What did you learn about market-ready weights?
- Ask: If you have an animal with a small frame, can you expect a heavy-weight animal at fair? Why or why not?
- Ask: If you have an animal with a large frame that is lightweight at fair, what could have happened? What could you have done different?
Why is that important? (APPLY)

- Ask: Can the animal you are raising this year meet the individual estimated final weight?
- Ask: How can the frame score of your animal affect the market ready potential at fair time?
- Ask: How does setting goals for the market ready weight of your animal help you in other activities you participate in?

Resources


Ohio State University Extension. (2000). Your Very First Step - Selection. Swine resource handbook for market and breeding projects (pages 3-7 through 3-15)
**Beef Beginning Planning & Record Sheet**

One of your market-project goals should be to have a market-ready animal. Knowing what your animal weighs now and its estimated end weight will help you achieve your market-ready goal.

**General Project Information**

Youth Name: ___________________________  Weigh-in Date: ___________________________

Animal Tag Number: ____________  Weight: _________  Hip Height (inches): ____________

Breed: ____________________________  ESTIMATED FINAL WT: ____________

Animal Tag Number: ____________  Weight: _________  Hip Height (inches): ____________

Breed: ____________________________  ESTIMATED FINAL WT: ____________

Animal Tag Number: ____________  Weight: _________  Hip Height (inches): ____________

Breed: ____________________________  ESTIMATED FINAL WT: ____________

Vaccinations (circle): wormer  8-way type  Other (list): ____________________________

**Estimate Average Daily Gain (ADG) for your steer(s)**

<table>
<thead>
<tr>
<th>Tag No.</th>
<th>Estimated Final Weight</th>
<th>Beginning Weight</th>
<th>Total required gain</th>
<th># Days in feeding period</th>
<th>Required daily gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>=</td>
<td>÷</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>=</td>
<td>÷</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>=</td>
<td>÷</td>
<td>=</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Think about this…*

1. What does market ready mean? Is your estimated final weight an ideal market weight for the beef industry?
2. The national average for ADG is 2.5 lb/day. Is your required ADG achievable?
Feeding Your Steer

Steers will consume about 3% of their body weight per day. A fattening ration is 2% in grain and 1% in hay. Make every effort to keep feed waste to a minimum. Grain waste can be 5 to 10% of the amount fed and hay waste 10 to 20%, depending on the facilities and your care in feeding.

List your concentrates (grain):

List your roughages:

List any other feeds:

Describe your feeding method, i.e., free choice, feed truck or by hand, number of times per day, fed in a bunk or feed pan, etc.

How much do you feed in the beginning? Choose one project animal to fill this out for.

**Grain:** Steer wt x 2% = pounds of grain per day
Pounds of grain per day ÷ 2 feedings per day = pounds of grain per feeding

Steer wt _______ x 2 % = _______ lb grain per day/2 feedings = _______ lb per feeding

**Hay:** Steer wt x 1% = pounds of hay per day
Pounds of hay per day ÷ 2 feedings per day = pounds of hay per feeding

<table>
<thead>
<tr>
<th>Current Weight</th>
<th>Est. Grain/day (wt X 2%)</th>
<th>Est. Hay/day (wt X 1%)</th>
</tr>
</thead>
</table>

Steer wt _______ x 1 % = _______ lb hay per day/2 feedings = _______ lb per feeding
Ask yourself these questions

1. How much does one scoop of grain weigh? Is one scoop of grain enough to feed per feeding?
2. How many scoops should you feed?
3. Calculate how much grain and hay per feeding you will feed by fair time.
4. Did you feed this amount in the beginning? More or less?

Weight & Feed Estimate Record
Tracking animal weight can tell you where your animal is compared to your goal. Weigh and record your animals’ weights. Estimate the amount of feed you should be feeding. The feed amounts are just minimum estimates. You should be feeding more due to the waste factor. If your animal is eating all the grain, increase it (slowly). It is better to push your calf, in the beginning, to get him market ready then run out of time in the feeding period.

Think about this....

1. Typical influences in ADG are feed, water, weather, and illness. Is the ADG more or less than predicted? What caused any problems?
2. After each weigh day, do you need to feed more grain or hay?
3. What happens if your animal does not have the ADG you predicted?
4. If your animal is not market ready by fair time, what happens?
5. Is carcass quality affected by your feeding?
Beef Frame Score Chart

Feeder cattle fall into three frame sizes: small, medium and large. Differences between breeds play a role in the frame size of a feeder calf. In general, British breeds have small to medium frames and Continental breeds have medium to large frames. Some breeds will have all three sizes. Frame size is determined by the length of the body, height at the hip, and length and size of the cannon bone.

Frame size is important in determining management and indicates how large the mature animal will be. In feedlots, sorting by frame size will help producers feed each size to its market weight. When selecting breeding heifers, animal selection is based on access and quality of feed resources.

Producers estimate the correct finish weight for an animal by determining its approximate frame score and proper finish (ideal slaughter size and weight) for that score. Frame scores are objective, numerical scores that reflect the growth pattern and potential mature size of an animal. Frame score values typically range from 2 (small) to 9 (large) and are calculated based on hip height and age.

In the chart below, find the animal’s age in the left-hand column and its hip height in that row to determine its approximate frame score. Now look at the bottom row under the animal’s frame score to determine its estimated finish weight. These are projections for average yearling cattle. Actual weights will vary due to muscling, body length, and condition.

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Frame Score 4 (medium)</th>
<th>Frame Score 5 (medium)</th>
<th>Frame Score 6 (large)</th>
<th>Frame Score 7/8 (large)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>45.3”</td>
<td>47.3”</td>
<td>49.3”</td>
<td>51.3”</td>
</tr>
<tr>
<td>11</td>
<td>46.2”</td>
<td>48.2”</td>
<td>50.2”</td>
<td>52.2”</td>
</tr>
<tr>
<td>12</td>
<td>47.0”</td>
<td>49.0”</td>
<td>51.0”</td>
<td>53.0”</td>
</tr>
<tr>
<td>13</td>
<td>47.8”</td>
<td>49.8”</td>
<td>51.8”</td>
<td>53.8”</td>
</tr>
<tr>
<td>14</td>
<td>48.5”</td>
<td>50.4”</td>
<td>52.4”</td>
<td>54.4”</td>
</tr>
<tr>
<td>15</td>
<td>49.1”</td>
<td>51.1”</td>
<td>53.0”</td>
<td>55.0”</td>
</tr>
<tr>
<td>16</td>
<td>49.6”</td>
<td>51.6”</td>
<td>53.6”</td>
<td>55.6”</td>
</tr>
<tr>
<td>Estimated Finish Weight</td>
<td>1050 to 1174 lbs</td>
<td>1175 to 1250 lbs</td>
<td>1251 to 1350 lbs</td>
<td>1351 to 1485 lbs</td>
</tr>
</tbody>
</table>
**Sheep and Goat Beginning Planning & Record Sheet**

One of your market-project goals should be to have a market-ready animal. Knowing what your animal weighs now and its estimated end weight will help you achieve your market-ready goal.

**General Project Information**

<table>
<thead>
<tr>
<th>Youth Name:</th>
<th>Weigh-in Date:</th>
</tr>
</thead>
</table>

Animal Tag Number: ___________  Weight: _________  Shoulder/Wither Height (inches): ____________

Breed: ___________________________  ESTIMATED FINAL WT: ____________

Animal Tag Number: ___________  Weight: _________  Shoulder/Wither Height (inches): ____________

Breed: ___________________________  ESTIMATED FINAL WT: ____________

Animal Tag Number: ___________  Weight: _________  Shoulder/Wither Height (inches): ____________

Breed: ___________________________  ESTIMATED FINAL WT: ____________

Vaccinations (circle): wormer  8-way type  Other (list): ____________________________

---

**Estimate Average Daily Gain (ADG) for your lamb/goat**

<table>
<thead>
<tr>
<th>Tag No.</th>
<th>Estimated Final Weight</th>
<th>Beginning Weight</th>
<th>Total required gain</th>
<th># Days in feeding period</th>
<th>Required daily gain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Think about this.......**

1. What does market-ready mean? Is your estimated final weight an ideal market weight for the sheep/goat industry?
2. The national average for ADG is 0.5 lb/day. Is your required ADG achievable?
3. Typical influences on ADG are feed, water, weather, and illness. How will you manage them?
Feeding Your Lamb/Goat

Lambs/goats consume about 3 to 3.5% of their body weight per day. Make every effort to keep feed waste to a minimum. Grain waste can be 5 to 10% of the amount fed and hay waste 10 to 20%, depending on the facilities and your care in feeding.

List your concentrates (grain):

List your roughages:

List any other feeds:

Describe your feeding method, i.e., free choice, hand fed, number of times per day, fed in a bunk or feed pan, on or off the ground, etc.

Think about this.....
1. What happens if your animal does not have the ADG you predicted?
2. If your animal is not market ready by fair time, what happens?

How much Do You Feed?
A finishing ration is 2 to 2.5% grain and 1% hay. Start your lamb/goat on ¼ to ½ pound of grain per day, slowly increasing to the finishing ration.

Think about this.....
5. How much does one scoop of grain weigh? Is one scoop of grain enough per feeding?
6. How many scoops should you feed?

Energy and Protein
Energy is needed for increased growth rate. Many different grains are high in energy. Protein is an important nutrient in a lamb/goat finishing ration. Protein is needed to build bone and muscle. Young, fast growing lambs need rations that contain 16 to 18% protein (13 to 15% for goats) to allow them to grow and develop to their muscle potential.
Minerals

Salt (sodium and chlorine) and calcium and phosphorus are important for lamb rations. Have loose salt (NOT a block) available free choice. Calcium (Ca) and phosphorus (P) should be fed in a ratio of 2.5 parts calcium to 1 part phosphorus.

Read your feed label and fill in the information below.

Name of feed: ___________________________ Protein content: ___________________________

Calcium content: ___________________________ Phosphorus content: ___________________________

List of ingredients:________________________________________________________

________________________________________________________

Think about this.....
1. What is the main protein source (ingredient) in your feed?
2. Is your feed providing the 2.5 to 1 ratio of Ca to P (Ca:P)?

Water

Water is the most important nutrient. Explain how your lamb/goat receives fresh, clean water.

_____________________________________________________________________________________

_____________________________________________________________________________________
### Sheep and Goat Frame Score Chart

Find wither height on the left and initial weight at the top to locate the estimated finished weight for your animal. If the initial weight is between the amounts shown, move to the next lower weight; for example, if the beginning weight is 55 lb, use 50 lb.

These are projections for average lambs. Actual weights will vary due to muscling, body length, and condition. Adjustments to estimated final weight can be made as follows: heavy muscle + 5 lb, light muscle –5 lb, thin condition + 5 lb, fat condition -5 lb.

<table>
<thead>
<tr>
<th>Wither Height</th>
<th>50lbs</th>
<th>60lbs</th>
<th>70lbs</th>
<th>80lbs</th>
<th>90lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>19&quot;</td>
<td>105-110 lbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20&quot;</td>
<td>110-115 lbs</td>
<td>105-110 lbs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21&quot;</td>
<td>115-120 lbs</td>
<td>110-115 lbs</td>
<td>105-110 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22&quot;</td>
<td>120-125 lbs</td>
<td>115-120 lbs</td>
<td>110-115 lbs</td>
<td>105-110 lbs</td>
<td></td>
</tr>
<tr>
<td>23&quot;</td>
<td>122-127 lbs</td>
<td>120-125 lbs</td>
<td>115-120 lbs</td>
<td>110-115 lbs</td>
<td>105-110 lbs</td>
</tr>
<tr>
<td>24&quot;</td>
<td></td>
<td>122-127 lbs</td>
<td>122-130 lbs</td>
<td>122-130 lbs</td>
<td>115-125 lbs</td>
</tr>
<tr>
<td>25&quot;</td>
<td></td>
<td>120-130 lbs</td>
<td>120-132 lbs</td>
<td>130-140 lbs</td>
<td>130-140 lbs</td>
</tr>
<tr>
<td>26&quot;</td>
<td></td>
<td></td>
<td>120-135 lbs</td>
<td>120-135 lbs</td>
<td>130-145 lbs</td>
</tr>
<tr>
<td>27&quot;</td>
<td></td>
<td></td>
<td>130-140 lbs</td>
<td>130-140 lbs</td>
<td>140-160 lbs</td>
</tr>
<tr>
<td>28&quot;</td>
<td></td>
<td></td>
<td></td>
<td>130-160 lbs</td>
<td>130-160 lbs</td>
</tr>
<tr>
<td>29&quot;</td>
<td></td>
<td></td>
<td></td>
<td>135-160 lbs</td>
<td>135-160 lbs</td>
</tr>
<tr>
<td>30&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>140-160 lbs</td>
</tr>
</tbody>
</table>
**Swine Beginning Planning & Record Sheet**
One of your market-project goals should be to have a market-ready animal. Knowing what your animal weighs now and its estimated end weight will help you achieve your market-ready goal.

**General Project Information**

Youth Name: ___________________________  Weigh-in Date: ___________________________

Animal Tag Number: __________  Weight: __________  
Breed: ___________________________  ESTIMATED FINAL WT: __________

Animal Tag Number: __________  Weight: __________  
Breed: ___________________________  ESTIMATED FINAL WT: __________

Animal Tag Number: __________  Weight: __________  
Breed: ___________________________  ESTIMATED FINAL WT: __________

Vaccinations (circle):  wormer  8-way type  Other (list): ___________________________

---

**Estimate Average Daily Gain (ADG) for your pig(s)**

<table>
<thead>
<tr>
<th>Tag No.</th>
<th>Estimated Final Weight</th>
<th>Beginning Weight</th>
<th>Total required gain</th>
<th># Days in feeding period</th>
<th>Required daily gain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ask yourself these questions**

6. What does market-ready mean? Is your estimated final weight an ideal market weight for the pork industry?
7. The national average for ADG is 1.8 lb/day. Is your required ADG achievable?
8. Typical influences on ADG are feed, water, weather, and illness. How will you manage them?
**Feeding Your Pig**

Consistency is the key to feeding. Make sure you feed your animals at the same time every day and that when you have to change batches of feed or increase the amount feed, you do it slowly over a period of 2 to 3 days.

Hand feeding is feeding a known amount of feed to each pig. Hand feeding is done when taming pigs to get to know them better and when watching pig weights to help a pig reach its ideal market weight.

Self-feeders can be used when feeding large groups of pigs. Check the feeder daily, making sure it contains feed and that the feed is flowing to the bottom correctly.

List your concentrates (grain):

List any other feeds:

Describe your feeding method, i.e., self-feeders or by hand, number of times per day, in a trough or feed pan, etc.

---

*Think about this . . .*

3. What happens if your animal does not have the ADG you predicted?  
4. If your animal is not market ready by fair time, what happens?

**How Much Do You Feed?**

It takes 3 to 4 pounds of feed for a pig to gain 1 pound of weight. If you know the number of pounds your pig must gain per day, you can estimate the amount of feed you will need per day. Faster-gaining animals will require less feed per pound of gain. More waste also means more total feed required.

Feed:

Required daily gain ________  X 4 lb = ________lb of feed needed per day

Keep in mind smaller pigs cannot consume as much as larger pigs. Refer to the table below.

<table>
<thead>
<tr>
<th>Pig Weight (lb)</th>
<th>Daily Feed Intake (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-75</td>
<td>2.85</td>
</tr>
<tr>
<td>75-125</td>
<td>4.46</td>
</tr>
<tr>
<td>125-150</td>
<td>5.58</td>
</tr>
<tr>
<td>150-200</td>
<td>6.35</td>
</tr>
<tr>
<td>200-255</td>
<td>6.69</td>
</tr>
<tr>
<td>225-250</td>
<td>6.8</td>
</tr>
<tr>
<td>250-270</td>
<td>7.3</td>
</tr>
</tbody>
</table>
Think about this…..

7. How much does one scoop of grain weigh? Is one scoop of grain enough per feeding?
8. How many scoops should you feed?

Protein

Protein is the most important nutrient in a swine ration. Protein is needed to build bone and muscle. If your pig is the lean and heavy-muscled type, you will need to feed a higher-protein-content feed. Pigs need feed with 18% protein (for 50-lb pigs) to 14% protein (for 250-lb pigs) in order to grow properly. Amino acids make up proteins. The right balance of amino acids is critical. Amino acids that need to be supplemented include lysine, tryptophan, threonine, and methionine.

Read your feed label and fill in the information below.

Name of feed: ___________________________ Protein content: ___________________________

List of ingredients: ________________________________________________________________

Think about this…..

3. What is the main protein source (ingredient) in your feed?
4. Is your feed providing additional amino acids?
5. If pigs can only eat so much a day (refer to the pig weight and daily feed intake table) how can they get the required protein?

Water

Water is important for survival. Explain how your pig receives fresh, clean water.

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________
**Swine Frame Score Chart**

Estimate amount of muscle and frame size in your animal then find the proper finished weight for USDA #1 grade. If the beginning weight does not permit an efficient economical gain of at least 1.8 pounds per day, consider setting the USDA #2 grade as your goal.

<table>
<thead>
<tr>
<th>USDA Grade</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>220-250</td>
<td>260-280</td>
<td>280-320</td>
</tr>
<tr>
<td>2</td>
<td>250-260</td>
<td>270-280</td>
<td>290-320</td>
</tr>
<tr>
<td>3</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
</tr>
</tbody>
</table>

- **Thick Muscle**

<table>
<thead>
<tr>
<th>USDA Grade</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>220-230</td>
<td>250-260</td>
<td>260-270</td>
</tr>
<tr>
<td>2</td>
<td>230-240</td>
<td>260-280</td>
<td>280-300</td>
</tr>
<tr>
<td>3</td>
<td>240-260</td>
<td>270-280</td>
<td>290-300</td>
</tr>
</tbody>
</table>

- **Moderate Muscle**

<table>
<thead>
<tr>
<th>USDA Grade</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200-220</td>
<td>220-240</td>
<td>240-260</td>
</tr>
<tr>
<td>2</td>
<td>220-240</td>
<td>240-260</td>
<td>260-280</td>
</tr>
<tr>
<td>3</td>
<td>230-240</td>
<td>260-280</td>
<td>270-280</td>
</tr>
</tbody>
</table>

- **Light Muscle**