University of Idaho Extension
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Frame Size and Market-Ready Weights

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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 minium 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 stadards, 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 beginning 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

Kinder, C.A. (2013). Livestock Science Experiment. *Frame size and market ready weights*. Retrieved from https://www.uidaho.edu/~/media/UIdaho-Responsive/Files/Extension/county/Gooding/4-H/animal-science/Experiment-Topics-for-club-work.ashx

Ohio State University Extension. (2011). Selection. *Beef resource handbook* (pages 2-11 through 2-24).

Ohio State University Extension. (2008). Meat Goats. *Goat resource handbook* (pages 115-119).

Ohio State University Extension. (2011). Selection: The First Step. *Sheep resource handbook for market and breeding projects* (pages 9-18).

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

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SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 1

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)

Tag No.	Estimated Final Weight		Beginning Weight		Total required gain		# Days in feeding period		Required daily gain
		-		=		÷		=	
		-		=		÷		=	
		-		=		÷		=	

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 <u>in the beginning</u>? Choose one project animal to fill this out for.
<u>Grain</u>: 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

<u>Hay</u>: Steer wt x 1% = pounds of hay per day
Pounds of hay per day ÷ 2 feedings per day = pounds of hay per feeding

Current Weight									
Est. Grain/day (wt X 2%)									
Est. Hay/day (wt X 1%)									

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?

SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 2

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.

Age (months)	Frame Score 4 (medium)	Frame Score 5 (medium)	Frame Score 6 (large)	Frame Score 7/8 (large)
10	45.3”	47.3”	49.3”	51.3”
11	46.2”	48.2”	50.2”	52.2”
12	47.0”	49.0”	51.0”	53.0”
13	47.8”	49.8”	51.8”	53.8”
14	48.5”	50.4”	52.4”	54.4”
15	49.1”	51.1”	53.0”	55.0”
16	49.6”	51.6”	53.6”	55.6”
Estimated Finish Weight	1050 to 1174 lbs	1175 to 1250 lbs	1251 to 1350 lbs	1351 to 1485 lbs

SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 3

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

Youth Name: _____ Weigh-in Date: _____

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

Tag No.	Estimated Final Weight		Beginning Weight		Total required gain		# Days in feeding period		Required daily gain
		-		=		÷		=	
		-		=		÷		=	
		-		=		÷		=	

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.

_____

_____

SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 4

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.

Beginning Weight

Wither Height	50lbs	60lbs	70lbs	80lbs	90lbs
19”	105-110 lbs				
20”	110-115 lbs	105-110 lbs			
21”	115-120 lbs	110-115 lbs	105-110 lbs		
22”	120-125 lbs	115-120 lbs	110-115 lbs	105-110 lbs	
23”	122-127 lbs	120-125 lbs	115-120 lbs	110-115 lbs	105-110 lbs
24”		122-127 lbs	122-130 lbs	122-130 lbs	115-125 lbs
25”		120-130 lbs	120-132 lbs	130-140 lbs	130-140 lbs
26”			120-135 lbs	120-135 lbs	130-145 lbs
27”			130-140 lbs	130-140 lbs	140-160 lbs
28”				130-160 lbs	130-160 lbs
29”				135-160 lbs	135-160 lbs
30”					140-160 lbs

SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 5

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)

Tag No.	Estimated Final Weight		Beginning Weight		Total required gain		# Days in feeding period		Required daily gain
		-		=		÷		=	
		-		=		÷		=	
		-		=		÷		=	

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.

Pig Weight (lb)	Daily Feed Intake (lb)
50-75	2.85
75-125	4.46
125-150	5.58
150-200	6.35
200-255	6.69
225-250	6.8
250-270	7.3

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.

_____

_____

SELECTION: FRAME SIZE AND MARKET-READY WEIGHTS - HANDOUT 6

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.

Frame Size (pounds)

USDA Grade	Small	Medium	Large	
1	220-250	260-280	280-320	**Thick Muscle**
2	250-260	270-280	290-320	
3	XX	XX	XX	
1	220-230	250-260	260-270	**Moderate Muscle**
2	230-240	260-280	280-300	
3	240-260	270-280	290-300	
1	200-220	220-240	240-260	**Light Muscle**
2	220-240	240-260	260-280	
3	230-240	260-280	270-280	