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Lamb Feedlot Management Guide



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Introduction

Fattening lambs in a feedlot management system is an effort to achieve a consistent supply of quality lambs that meets market needs for premium quality. It allows producers to maintain production when lush pasture is not available, to achieve rapid growth with a balanced ration of grains and alfalfa-grass dry hay, to generate a year round cash flow, and to value-add ration components. Through good management, preventative veterinarian practices, and balanced rations, the cost per kilogram of weight gain can be less than the traditional feeding methods of feeding lambs after weaning in Iraq.

Economic Considerations

It is important to do a careful financial analysis to assess the viability of a lamb feedlot before committing resources to an intensive feeding system. You need to pre-determine the profitability of a lamb feedlot program. You need to know the feed requirements for a specified daily rate of gain, the cost of that feed daily, the market weight you are targeting, the estimated market price when finished, and the break-even costs to achieve a return on capital investment.

Feed Cost

As most lambs require 10-14kg of feed to produce 2kg of live weight, ration cost is the major issue within a feedlot operation. The

amount of feed required will depend on:

- weight and health of the starting lambs
- quality of feed and a balanced nutritional ration
- genetics of the lamb
- feed conversion ratio
- target market weight

Most lambs will need to be fed within a feedlot for 3 to 5 months when feeding for growth rate is the primary goal. Survival feeding will require a much longer and more expensive cost per kg of weight gain.

A diet of straw and poor pasture will result in very little or no weight gain. If quality feed is not available, it is better to sell the lambs at weaning before you start losing money.



Alfalfa-grass being mowed into a windrow where it will dry to 10% moisture and then baled for storage and feeding to lamb feedlot.

When you are buying feeds consider quality, continual availability, and price. The major feed components especially alfalfa-grass hay should be tested for energy and protein. Grains like barley or

wheat do not vary in feed nutrients much, but hay can lose nutrient value by poor post-harvest methods. The protein in hay is in the leaves. Look for lots of leaves in alfalfa hay. Contract the hay purchases and grain purchases for both price and quality with a reputable feed mill, feed depot, custom hay maker, or large hay producer with the equipment to properly harvest and handle hay after harvest.

Buying Quality Alfalfa-Grass Baled Hay

Before contracting a hay supplier, learn their harvesting and handling methods. Alfalfa-grass fields should be cut when the alfalfa is just starting to bloom. With the hot dry weather in Iraq, the green hay should be mowed into a windrow with a mower conditioner (pictured below), and left in the windrow without disturbing it until it is 15 % moisture. The time it takes to get to that level of moisture will depend on the temperature and humidity. If it is drier than 10%, the baling process will lose too many leaves. During hot dry summer months, baling might have to be done at night or early morning. The hay provider needs to have the training and equipment to make high quality hay. Alfalfa-grass hay will provide the lowest cost protein available in Iraq, and protein is an essential nutrient for rapid and efficient weight gain.

Buying Grain

Barley, wheat, and corn are good economical sources of energy. All three are very close to each other for energy feed value as long as those grains are free of dust, molds, and toxins. As shown in Table 2,



Grain ration being fed to lambs along with alfalfa-grass hay

wheat is higher than barley for energy, however barley's energy is easier for lambs to utilize and it is higher in protein. Generally, the prices of these three grains are similar. Fed in the proper balanced ration, barley, wheat, or corn and good alfalfa-grass hay will provide the nutrients needed to get a healthy lamb to gain 200 grams of weight or more per day.

Risk

Starting a feedlot involves financial risk. Lamb deaths, shy feeders, poor weight gains, and unexpected changes in feed or market prices will affect the economic success of the venture. When budgeting, always include some risk factors, because risks are part of running a feedlot. Financial risk can be minimized by ensuring:

- An adequate supply of quality feed and feed storage on the feedlot site large enough to keep several months' supply on location.
- Contract feed supply for grain and hay.
- Sound feedlot management.
- Contract sales in advance the weight, age, and price for finished lambs.

Capital Expenditure

A lamb feedlot can be built without significant capital outlay. Well-designed facilities can be built at low cost, or existing facilities may be modified to provide a suitable feedlot. Adequate shade and water are essential. Even with the best of feed rations, lambs will not gain weight if adequate shade and water are not provided.

The biggest capital outlay when establishing a feedlot will be for feed troughs and hay racks. The fencing cost need only be the cost of steel post 3-4 m apart and lamb proof interlocking fencing. The hay storage facility need only be a roof with no sides, but the grain storage building needs to be rodent proof. Feed storage should be near the feed trough and hay rack to save time and labor getting feed to lambs.

Economic Considerations



**Lambs eating grain
in a feedlot**



Lambs in large feedlot

- Every effort needs to be made in purchasing feeder lambs to select healthy lambs that are aggressive eaters.
- When purchasing lambs, a 14 day introductory period is needed to accustom new lambs to the hay grain ration of the feedlot. A lamb will consume around 15kgs of feed during this period with little weight gain.
- Shy feeders and sick lambs should be identified during this period and removed from the feedlot. Shy lambs will not gain weight in a feedlot so it is better to either cull them or consider the feasibility of constructing a small feeding and housing area for shy lambs. When budgeting for the feedlot, figure on 5% of the lambs will be shy or die.

Lamb for 100 days	Dinars	USD
Cost of 10 Kg lamb at \$3/kg	36,000	\$30.00
Cost of feed :		
750g alfalfa hay /day at \$.24 /kg for 100days	21,600	\$18.00
750g barley grain/day at \$.24/kg for 100 days	21,600	\$18.00
Non-feed cost	24,000	\$20.00
Total Cost	103,200	\$86.00
Sale of 40 kg lamb at \$3/kg	144,000	\$120.00
Profit	40,800	\$34.00

Table 1 - Example of a preliminary budget

Building a Feedlot

Because of the narrow and variable profit margin in Feeder lamb feedlots, designing and building a feedlot must take into consideration both construction cost and a design to make the most efficient use of labor.

Site

Select a well drained site with the proper slope away from the lamb shade shed, the feed bunk, and hay rack with easy access to water. Place hay storage cover and grain storage near the feed bunk, yet with easy access to the road for the convenience of hay and grain delivery. Depending on the location in Iraq, the rainfall is very light so there should not be much mud problems, but when rain does fall it could be heavy at times.

Size

Feedlot size is determined by the number of lambs to be penned. As a guide, provide each lamb with a minimum of 5 square meters however an additional 10 to 20 square meters per lamb will reduce social stress and the number of shy lambs. The Inma Sheep feedlot project has suggested four lots of 100 lambs each totaling 400 lambs. Each lot optimally should be 1,500 square meters in size.

Water

A plentiful supply of clean, good-quality water is essential. Water

should be in a trough and off the ground, to aid in keeping it clean and free of manure and urine. This point can not be overemphasized especially in the hot dry temperatures of Iraq. Poor-quality water - including contamination by feed, dust, and feces - leads to a reduction in water intake, and slower rates of gain.

Water troughs should be placed at the opposite end of the feedlot to hay racks and feed troughs. Raise them about 40 cm above the ground with gravel or cement base around the trough. That will allow drainage from the water trough because the lambs will spill water.

The trough should be large enough to accommodate easy access for the number of lambs to be housed. It is recommended that the water trough should be 2.5 meters long and at least 30 cm wide per 100 head. The trough should be cleaned at least once a day and more often if it becomes contaminated.

The average intake of water per lamb under US feedlot conditions is about 2.5 times the feed intake, or about 4 liters per lamb per day (400 liters for 100 lambs). However, in Iraq's hot summers; the intake will be much higher, probably as much as 8 liters per day per animal.

Feeding Equipment

Feed should be available at all times. This will facilitate higher rates of gain per day which improves overall feedlot

efficiency. It also helps to reduce the risk of digestive problems and shy feeders.

Hay and grain should be fed separately, with feed troughs for grain and hay racks for hay. Feed grain troughs will require twice-a-day filling. The hay rack should never run out of hay.

Troughs

Troughs can be simple and inexpensive. They can be accessed from one or both sides, and should be constructed so as to prevent lambs from standing in them and contaminating the feed.

Allow a minimum of 15-30cm of trough space per lamb, depending on the trough system used. For example, 100 lambs need a trough length of 15 meters if able to access feed from both sides. If they only have access to one side 100 lambs will need a trough length of 30 meters.

A trough width of 30cm and depth of 20-25cm is ideal. Spreading the troughs out within the feedlot may also minimize the incidence of shy feeders. The top of the troughs should be 30cm above the ground level. Troughs should be cleaned daily and placed well away from the water source.



Ideas for alfalfa-grass hayracks



Wire lowers hay waste

Hayracks

Hay can be successfully fed from hay racks within feedlot pens. Simple racks can be made from 10-15 cm square mesh fence held up by steel post. A tray near ground level will reduce trampling and waste. The hay rack can be in the pen where lambs can consume hay from both sides or along the fence where they can eat from only one side. Again, it needs to be twice as long if feeding from one side. There are no suggested lengths, but make it plenty long so all the lambs that want to eat hay can. Allow extra length to lessen the number of shy lambs. This type of hay rack is low-cost construction.

Hay and grain should not be fed in the same trough unless the hay is ground and mixed with the grain, or what is called Total Mixed Rations (TMR). As lamb feedlots expand in size, a TMR system mixer might be considered. A 400 lamb feedlot is not big enough to justify the cost of a TMR system.

Selecting Lambs

Weight and Condition

Economic success is more likely in feedlots with healthy lambs that have just been weaned and are disease and parasite free. Be especially vigilant for pinkeye, lameness, and scabby mouth. Live weight information at regular intervals is important and weighing scales is a fundamental requirement for efficient management of the feedlot. Weighing is required when selecting lambs, and to monitor performance over time. Scales need to be easily accessed so weighing can be done frequently. Animals need to be identified so weight gains and veterinarian treatments can be recorded in the herd record book. If selecting lambs that will be housed together, select those lambs that are similar in size and weight. That will provide a low-stress feedlot environment resulting in fewer shy feeders.



Ear tag identification



Another identification idea

Preparing Lambs For a Feedlot

To make a profit in a lamb feedlot two management procedures are high on the list:

- 1) prepare lambs properly to enter the feedlot, and
- 2) properly prepare them for sale.



Veterinarian checking lambs and attaching identification tags

Veterinarian Check

A veterinarian must check all lambs for pinkeye, lameness, and scabby mouth, and treat all animals with a broad-spectrum drench for parasites before they enter the feedlot.

Sheep should be vaccinated for any known sheep diseases that are common in the region where the lambs were bought, and given a shot intramuscularly with vitamins A, D, E, and B12. The neck or ear area is the best site for vaccinations so damage is not done to the carcass.

Shy Feeders

Remove shy feeders from the feedlot. They may be sold, or put in separate pens. Five to ten percent of the lambs will not adapt to the

feedlot situation. If the number exceeds that figure, the feeding and management system needs to be re-evaluated.

Starter Feeding

The first 14 days in the feedlot are very critical because rapid feed changes can cause digestive problems. Both topics will be discussed later. (See table 3)

Feed Ration

The feed ration will contain grain, forage, and necessary minerals such as calcium, phosphorous, salt, and trace minerals. Additional additives may be needed to improve lamb weight gain, depending on quality of the grain and hay. Feed contamination by moulds, dust or rodents is a common reason for low dry matter intakes and poor performance.

Key Ingredients

Lambs need three key ingredients from the ration – energy, protein, and fiber – in order to grow to market weight as economically as possible. In Iraq, the most economical sources of energy are grains like barley, wheat, or corn. These grains also provide some protein but are primarily fed for energy. Protein in the ration can come from soybean oil meal, or other oil seed meals, and alfalfa-grass hay. On a kilogram of protein cost basis, early cut alfalfa-grass hay dried and baled properly is the lowest cost protein presently in Iraq for sheep. In fact top quality alfalfa-grass hay and barley grain fed in the proper balance will provide most of the energy, protein, fiber, minerals, and vitamins needed for efficiently growing lambs to market weight.

Fiber

Lambs are ruminants; therefore they also need fiber. Straw is a common feed fed in Iraq. It is high in fiber, but very low in energy and protein, and is not a feed. Straw should be used for bedding or left

in the field and plowed down to build soil structure. Alfalfa-grass hay also has fiber but at much lower levels. A well-balanced ration of barley and alfalfa-grass hay, not only provides most of the protein and all of the energy needed, but also all the fiber needed. Too much fiber limits dry matter intake, and stunts growth.

Energy

Energy is provided through the breakdown of carbohydrates, protein and oils/fats within the rumen and small intestine. Starch is the most common form of carbohydrates and is found in cereal grains. Feeding excess protein can be used to provide additional energy for feedlot lambs; however, it is less efficient than starch in the digestive system, and is less cost effective.

Oils/fats are energy-rich forms which provide as much as 2.25 times the energy of starch. Unfortunately, levels exceeding 7% in ruminant diets can lead to a decrease in rumen efficiency.

Protein

Protein is necessary for muscle development and appetite. Inadequate protein can lead to a reduction in rumen protozoan (bugs) numbers and activity, a reduction in intake, and slower weight gains. Crude Protein (CP) requirements vary according to energy content and the lamb's age and live weight. Young lambs require higher levels of protein in the ration at any given energy intake due to their higher requirements for muscle development.

Urea is a cheap form of non-protein nitrogen that the rumen mi-

crobes are able to turn into protein for the lamb's use. Urea can be included in the ration but not to exceed 1%-2% of the ration, and must be mixed into the grain evenly. Lambs under 30 kg of weight should not be fed urea because their rumens are not yet fully functioning. If urea is used in the ration, it should be introduced slowly over 10 to 14 days, and must be evenly mixed into the ration. Urea is converted to crude protein by first being converted to ammonia by the rumen microbes. A sudden increase of ammonia can cause death.

	%C P	NEm	NEg	%ADF	%NDF
Barley	13.5	2.07	1.41	7	19
Wheat	11.3	2.20	1.52	4	14
Corn	10.0	1.94	1.30	3	9
SBOM	49.0	2.07	1.41	10	15
Alfa-G Hay	18.0	1.32	0.75	31	42
Straw	3.6	0.75	0.22	54	85

Table 2 – Energy, protein, and fiber in common Iraqi feeds

SBOM = Soybean Oil Meal; **%CP** = Percent Crude Protein; **NEm** = Net Energy for maintenance; **NEg** = Net Energy for growth; **%ADF** = Percent Acid Detergent Fiber; and **%NDF** = Percent Neutral Detergent Fiber. In the NEm and NEg figures listed above the information on the feeds is listed as Magi calories per kilogram. (Note that straw is very low in all important nutrients and too high in fiber)

Minerals

Lambs need a range of minerals to maintain good health, but the two most important are calcium and salt. Most cereal-based rations provide enough of the trace mineral needed with the exception of

calcium and salt. However, alfalfa hay is high in calcium, and when that is part of the ration, calcium does not need to be feed to feeder lambs. In the feedlot lamb project salt must be provided. That can be done either by having loose ground salt free choice or mixing it into the grain mix at 1 % of the volume by weight. Salt licking blocks will not provide the salt needed. A lamb would have to stand there all day and do nothing but lick salt to get enough sodium.

Vitamins

Lambs are only fed for a short time in feedlots, so vitamin deficiencies are unlikely. However, it is recommended that the lambs be given shots for A, D, E and B12 vitamins when they first come into the feedlot in the neck or ear area. High quality alfalfa-grass hay will help to avoid many mineral and vitamin deficiencies.

Health and Disease

General Information

There are numerous health and disease issues commonly found within a feedlot system. Many are preventable, through vaccinations for common diseases (follow veterinarian's recommendations), vitamin shots when entering the feedlot, proper balanced feed rations, and good daily management.

Three of the more common health and/or disease problems found within feedlot systems are discussed below. The local veterinarian should assist with diagnosis and management of all health and/or disease related issues. This pamphlet focus is on preventive management to avoid or control these problems.

Acidosis (Grain Poisoning)

Lambs that are not accustomed to grain and are started on grain too fast are prone to acidosis. Acidosis is most likely to occur when:

- Lambs are being introduced to grain
- There is a sudden increase in grain intake
- There is a sudden change of grain in the ration

Gradual introduction of grain in rations is essential if grain poisoning is to be avoided (see Table 3 for a guide to starting lambs on grain). Loose droppings are an early indication of digestive disorders. Starter lambs should be observed twice a day when introducing

them to grain. If loose droppings are observed, stop increasing grain for a few days until they firm up again. If droppings develop a watery consistency, return to a hay-only feeding and then start over again once the droppings firm up again.

Symptoms of acidosis in lambs may include scouring, abdominal pain, a sluggish and dehydrated or bloated appearance, and an arching of the back. Treating lambs suffering from acidosis is difficult and rarely successful, unless treated in the early stages by a veterinarian. Emphasis can not be over emphasized. Treatment should be left to the veterinarian.

Laminitis

Laminitis is similar to founder in horses. Affected animals appear lame and are hesitant to stand or move. It is a form of acidosis; laminitis is caused by the release of toxins within the bloodstream following consumption of excessive dietary energy or protein. Affected animals may recover within several days. Treatment is to remove animal from the feedlot and feed good quality hay.

Bladder Stones

Also know as water belly and urinary calculi, it is caused, by formation of stones within the bladder and/or kidney tracts. The bladder will eventually burst, leading to death. Bladder stones can form when rations are low in calcium in relation to phosphorous, high magnesium intakes, too little roughage (good hay), and poor water quality causing low water intake.

Prevention of bladder stones – make sure the calcium to phosphorus ratio is correct in the ration (add ground limestone if needed), feed high quality alfalfa-grass hay (Alfalfa is high in calcium, grass is high in phosphorus), make sure the ration contains adequate fiber, and keep the water supply fresh and clean.

Most diseases and deficiencies can be prevented through good feeding and management. The following are guidelines for starting and feeding lambs properly.

Starting to Feed

Rations used for feedlots fall into two broad categories: the starter ration and the finisher ration.

- The starter ration allows lambs to become accustomed to the high grain content of the finisher ration, while minimizing the risk of grain poisoning.
- The finisher ration should be high in energy, lower in roughage and well-balanced in protein to obtain optimum growth rates within the limitations of feed availability and cost.

Starter Rations

The starter ration is actually a series of rations (see Table 3) The first is total alfalfa-grass hay that is gradually replaced with grain until the desired concentration is obtained. (For example: 60 % grain and 40% hay.) A minimum of 14 days changeover period is essential, with twice daily observations for shy lambs and loose feces. If loose feces are observed, stop the progressive increases in grain until the feces return to normal. Again follow the guidelines given in Table 3.

Keep lambs on the hay-only ration until all lambs are feeding. To know this, frequent observation is needed. Lambs should remain on the low-grain ration until all lambs have started to gain weight. Frequent weightings are essential and each lamb's weight must be recorded. To do that, each lamb must be identified with an ear tag or other method of identification, and that information recorded in the herd recordkeeping book. It is critical that good quality alfalfa-grass

hay is available for the starter ration. This will encourage lambs to accept the new feeding system and the feedlot.

Days	Grain Concentrate / head/day
Hay only	Until all lambs are eating
2 to 4	100 grams
5 to 7	250 grams
8 to 10	400 grams
11 to 14	550 grams

Table 3 – Grain introduction schedule using high quality alfalfa-grass hay freely available and grain fed separately.

The starter ration period is the most crucial part of feedlot nutrition management.

Finisher Rations

Final or finisher rations should be high-energy, consisting of 50% to 60% concentrate principally cereal grain (barley, wheat, or corn), and 50% to 40% high quality alfalfa-grass hay. High growth rates and efficient feed conversion can only be obtained with a well-balanced high-energy ration. The following ration will provide nutrients needed to achieve a daily weight gain of 250 gram according to requirements established by the National Research Council. (See the publication titled “Nutrient Requirements of Small Ruminants”.

From the very first day that lambs are placed in the feedlot, alfalfa-grass hay must be available free choice in a hay rack in the feedlot. As lambs grow larger they will consume more hay.

Ground limestone and protein supplement must be added to the ration if high quality alfalfa hay is not fed. The protein supplement can be soybean oil meal (SBOM) or some other high protein oil meal. A small amount of urea can be feed to lambs over 30kgs. Alfalfa is high in calcium and protein.

Feed	g/head/day	Kg/day/100 head
Barley (Wheat or Corn)	550 – 600g	55 – 60kg
Ground Salt free choice	1 - 3g	0.1 - 0.3kg
Alfalfa-Grass hay free choice	550 – 600g	55 – 60kg

Table 4 – Finishing ration for growing lambs

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