



West Virginia Univer-

News Ewe Can Use

Volume 6, Issue 2

Summer 2004

Published in Conjunction with the West Virginia University Davis College of Agricul-

The New Director

Hello Everyone,

My name is Fane Irvine. I was recently hired as project director of the West Virginia Sheep Management Project (WVSMP). As many of you know, Ms. Debi Marsh has left the project and is furthering her education, working to complete her doctorate degree. I am presently working and can be contacted at the Franklin office. I intend to work very hard to maintain the standard of service that Ms. Marsh provided to the West Virginia sheep producers. The WVSMP will continue to provide the services that have been available in the past to help producers realize a greater return and help revitalize the sheep industry in West Virginia. With my personal experience and background, I hope to provide a valuable service to the sheep producers throughout the state.

I am a West Virginia

native and was raised on a small farm just north of Marlinton, in Pocahontas County. During high school and as an undergraduate in Animal and Veterinary Sciences, I earned extra money for college by shearing sheep in eastern part of the state. After graduating from Pocahontas County High School, I attended Potomac State College where I received an Associate of Arts degree in agriculture. I then finished my coursework and received a Bachelor's degree in Animal Science in 2002 at West Virginia University. As an undergraduate student, I gained experience with out-of-season breeding while doing work-study for the Division of Animal and Veterinary Sciences, as well as other services that are currently offered by the WVSMP. After completion of my undergraduate work, I received a Masters of Agriculture from West Virginia University. As a graduate student, I

had several classes dealing with management of livestock and pastures, along with courses dealing with marketing, both important components of a successful sheep industry. I participated in several lamb projects over the years and I have general experience working with commercial flocks as a part time employee at several different farms during high school and college.

While my experience with the sheep industry is not as broad as that of my predecessor, I am confident that I can find the answers to your questions or find someone who can. If you are interested in any of the services offered by the WVSMP, please contact me in the office at (304)-358-3660 or by e-mail at fane.irvine@mail.wvu.edu



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Scrapie Genetics

Scrapie costs American sheep producers an estimated \$20 million per year in lost sales abroad, increased costs, and in lost animals. Scrapie is a Transmissible Spongiform Encephalopathy (TSE), a disease that degenerates the central nervous system of sheep. The disease has been reported in countries throughout the world with few notable exceptions (Australia and New Zealand). The first case of scrapie was discovered in the United States in 1947.

Scrapie is NOT caused by genetics, but the genetic make-up (DNA) of an

animal determines the level of susceptibility to scrapie, if it is exposed to the infective agent. Scrapie may be transmitted when a susceptible lamb come into contact with infected placenta and birth fluids from an infected ewe during lambing, but clinical signs of scrapie will not appear for 2-5 years after exposure.

resistance to scrapie).

Out of the many sheep genes scientists have identified, one pair affects scrapie susceptibility as well as the disease's incubation time. That gene is known as **PRNP**, which stands for the **PRioN** Protein gene. Each sheep has **two copies of the PRNP gene**; one derived from each parent.

In uninfected sheep the PRNP gene produces the normal cellular prion protein molecule known as **PrP^c**. In scrapie infected sheep the abnormal prion protein, **PrP^{sc} or Prions**, is found. Prions are closely associated with scrapie infectivity and are be-

lieved to be the causative agent.

Genes are made up of **codons**. Each codon instructs the body cells to put a specific amino acid at a particular location when building a protein molecule. Since PrP^c is composed of **256 amino acids**, these locations are numbered from **1 to 256**. Two codons **-136 and 171-** are particularly important to scrapie susceptibility. Codon 171 can give instructions to insert the amino

acid **Histidine (H) Glutamine (Q), or Arginine (R)** at position 171. The letter in parentheses is the single letter biochemical abbreviation for each amino acid. At codon 171. R is very important because it produces the greatest scrapie resistance. Codon 136 can give instructions for either **Alanine (A) or Valine (V)** to be amino acid at 136 of PrP^c. The presence of V (Valine) at 136 makes **AV QR** sheep susceptible to **certain** scrapie strains.

Producers need to be familiar with six genotypes and their corresponding amino acid combinations to understand genotyp-

ing for scrapie resistance. When both copies of the PRNP gene are considered, a sheep can have one of six genotypes. Based on what is **now** known, the following genotypes at codons 136 and 171 (shown in Table II) are used to determine the scrapie susceptibility of sheep. Source: Scrapie Control: Genotyping – A New Tool For Producers. A PowerPoint presentation produced by the National

Producers should consider using scrapie genetics (genotyping) as a management tool if:

- They have a breed in which scrapie is prevalent and they have purchased ewes
- They have purchased ewes of unknown scrapie status.
- They have observed signs of scrapie in their flocks in the past.
- Customers are requesting scrapie-resistant breeding stock.
- They wish to provide scrapie-resistant breeding stock to their customers.

Testing can determine the genotype of sheep with a blood or tissue sample. The genotyping test measures only an animal's susceptibility/resistance to scrapie, **not whether it has scrapie**. An animal's genotype never changes, so it can be tested at any age, and because it never changes, so under most circumstances one test during an animal's life is adequate to determine its genotype (susceptibility/

ing for scrapie resistance. When both copies of the PRNP gene are considered, a sheep can have one of six genotypes. Based on what is **now** known, the following genotypes at codons 136 and 171 (shown in Table II) are used to determine the scrapie susceptibility of sheep. Source: Scrapie Control: Genotyping – A New Tool For Producers. A PowerPoint presentation produced by the National

| Ewe | Rams Genotype | | |
|----------|---------------|-------|-------|
| Genotype | AQ | VQ | AR |
| AQ | AA QQ | AV QQ | AA QR |
| VQ | AV QQ | VV QQ | AV QR |
| AR | AA QR | AV QR | AA RR |

Highly susceptible
Rarely susceptible
Resistant

Table II. Genotype Susceptibility/Resistance Combinations

1. AA RR - Sheep which are *resistant*.
2. AA QR - Sheep which are *rarely susceptible*.
3. AV QR - Sheep which are *susceptible to some scrapie strains**.
4. AA QQ - Sheep which are *highly susceptible*.
5. AV QQ - Sheep which are *highly susceptible*.
6. VV QQ - Sheep which are *highly susceptible*.

*These strains are believed to occur with low frequency in the U.S.

Address Corrections

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The U.S. Animal Identification Plan Sheep Species Working Group Report Summary

The goal of the National Animal Identification System is to be able to trace an animal's entire history within 48 hours. After consideration, the Sheep Working Group (SWG) concluded that moving the USA sheep industry toward the "48 hour" goal would best be achieved by, first using the national Scrapie identification plan as the starting point. The national Scrapie ID plan is not ideal, it is however a more complete identification system than exists for any other species in the United States.

Second the SWG recognized that no purely visual ID system would achieve the final tracking goal, so an electronic method is needed. However no proven

RFID national tracking system for small ruminants currently exists in the world.

The SWG strongly supported multi-environment research within the USA to demonstrate the potential problems and solutions involved in a national RFID tracking system for the US sheep industry.

Recognizing that the USA sheep industry is small relative to the sheep industry in Europe and Australasia, the SWG knows that ambitious research is underway overseas to develop, test, and prove RFID for sheep for national tracking. The Sheep Working group strongly supported staying in close contact with our overseas counterparts in their respective sheep industries regarding RFID identification systems for

official usage.

Finally the SWG recognized that the ID devices and RFID readers suitable for cattle and pigs may not be suitable for sheep. Eartags in sheep are more likely to be lost and more likely to cause infection. Tests in multiple countries indicate that accurate reading of RFID devices in moving stream of sheep is more difficult than cattle. For these and other aspects, the minimum standards and features will need to be both different and have yet to be developed.

Source: The US Animal Identification Plan Sheep Species Working Group Report May 4, 2004

Reproductive Management Practices to Improve Profitability in Fall Breeding Flocks: Preparing for the Breeding Season

By

Marlon Knights, Dee Singh-Knights, Paul Lewis and Keith Inskeep

Poor reproductive management increases cost, and decreases revenue and profitability. The sheep producer will encounter few things that are more disappointing than taking a ewe through winter and failing to get 1 or 2 lambs from her in the spring. Three (3) things might account for this – she never became pregnant, she became pregnant but lost the pregnancy before lambing, or she lambed but the lambs died during or after birth. While it is not possible to get every ewe to give birth to healthy twin lambs, there are a few things that we can do to minimize the number of open, non-lactating ewes in the spring. The key to a successful lamb crop is planning and preparation, so although it is July/August, there are some things you may want to consider. Consider when you would like your lambs to be born. The ewe has a 5-month pregnancy (gestation) pe-

riod, therefore for ewes to begin lambing by March 1st bucks should be turned in by October 7th. Once the schedule for lambing season is set you need to manage your rams, ewes and replacement ewe lambs with this goal in mind.

Managing the Ram Prior to the Breeding Season

A barren ewe can reduce your lambing rate by a few percentage points but an infertile ram can reap havoc on your lamb crop and thus the profitability of your flock. Good ram management starts with selecting the right ram and ensuring that he is equipped to do the job. Therefore, every producer should conduct a Reproductive soundness exam (RSE) on their mature and ram lambs before the start of the breeding season. The RSE tells you if you should use that ram and the number of

females he might be best able to "cover". Mature rams and ram lambs that fail the RSE may be re-evaluated later before a decision on culling them is made. If you are unfamiliar with the RSE contact the WV Sheep Management Project (WVSMP) for a demonstration.

Reproductive activity and capacity of rams declines during spring and summer, and then increases before peaking in mid- to late fall. Producers who wish to breed early in the fall (August – mid September) must ensure the semen quality and breeding capacity of their rams are evaluated prior to the breeding season. This is particularly important for some of the black-faced meat type breeds such as Suffolks and Hampshires that tend to show a more pronounced decline in reproductive activity.

Your rams (and bucks) should

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be prepared for breeding by deworming and trimming feet at least 1 month prior to joining. Your rams are most active during the breeding season. Consider, providing some grain to rams if they are too thin. Aim to achieve a body condition score of 3.5 (5.0 scale) by the beginning of the breeding season. Remember that neither under nor over conditioned rams are desirable. Removing any excess wool will allow the ram to more easily dissipate heat during those long days of teasing and mating and allow him to cover more ewes. Because the spermatogenic cycle requires 49 days, rams should be sheared 7 to 8 weeks before the breeding season and be kept in cool and shaded environments.

Special attention needs to be paid to purchased rams or rams that have been on the show circuit. To prevent the introduction of any new diseases rams should be purchased and quarantined for 45-60 days before the breeding season. During this period these rams should be subjected to BSEs, foot trimming, vaccinations, deworming and conditioning. The 45-60 day quarantine period also allows rams to recover from the temporary decrease in fertility associated with stressful events such as prolonged transportation and changing environments that is observed in some cases.

Managing the Ewe Prior to the Breeding Season

Ewes should have lambs weaned at least 2 months prior to the start of the breeding season. On the day of weaning it is a good time to make final decisions on which ewes should be culled. Ewes with bad feet or udders, that did not lamb, or in exceptionally poor condition should be culled. Review lambing records and consider culling ewes had difficulty during lamb-

ing, lambed later than average had a fertility record below the herd average, or failed to raise a lamb of their own. Remember, the ewes you select will shape the composition of your flock in the future.

The time at weaning should also be used to trim hooves, and treat ewes for internal parasites. Consider vaccinating ewes to control vibriosis and enzootic abortion at this time. It is generally recommended that ewes be bred at a BCS of 3.5. Performing body condition score (BCS) at weaning allows the producer sufficient time to supplement those thin ewes that are unlikely to attain the desired BCS on pasture alone. All ewes should have access to good quality mineral supplements with adequate selenium.

The practice of flushing ewes can be considered if the prolificacy (lambs born from each ewe) for your flock is lower than the average for the breed. Flushing involves increasing the nutrient density (1lb of whole corn/day) of the diet 2-3 weeks prior to breeding, and is aimed at increasing the number of eggs shed at breeding and the number of lambs born at lambing. Remember, not all ewes will “flush”. Ewes that are under (BCS < 2.5) or over conditioned (BCS > 3.5) will not show a flushing response.

Managing the Replacement Ewe Lamb Prior to the Breeding Season

In general, ewes that lamb for the first time by 12-14 months rather than as 2-year-olds have greater lifetime productivity. A final decision should be made on the lambs that will be retained in the

breeding flock at the time of weaning. For commercial production, cross-bred ewes are recommended; as they tend to show better performance in reproduction and maternal traits compared to purebreds. By limiting selection of ewe lambs from twins or triplets born earlier in the lambing season, the producer can indirectly select for improved fertility and prolificacy. Selecting lambs born earlier in the season also ensures that the replacements are older and larger at breeding. Lambs from twin and triplet births would have had a moderate rate of growth, and would not have excess fat deposition in the udder and lower milk production that is observed in single lambs that grow rapidly before reaching puberty. Ewe lambs would probably not attain puberty prior to attaining about 60% of their estimated mature weight. For many of the breeds used in WV this means a weight in excess of 100 lbs. Following weaning, replacement ewe lambs can be supplemented with corn or barley (0.5 – 1.5/lbs/day) to achieve the daily gains needed to reach the target body weight prior to breeding.

Concluding Remarks:

The number of lambs marketed is the major factor affecting total pounds sold and thus the profitability of the sheep enterprise. The number of lambs marketed is in turn determined primarily by the number born, assuming post natal mortality is low. Planning and preparing for the breeding season is the first step in ensuring a great lamb

A Few Marketing Management Practices That Can Improve the Bottom Line of Your Sheep Operation

By Dee Singh-Knights, Denny Smith and Marlon Knights

Those of you that had fall or early spring born lambs are probably quite satisfied with the prices you obtained over the last few months. We can expect these prices will be falling in the near future because the majority of your spring-born lambs will be ready to hit the market. In West Virginia (WV), the lambing season for over 90% of producers runs from January to April and so the majority of lambs enter the market place in late summer and fall (Figure 2).

While the individual pro-

ducer by focusing on unit cost of production, size of operation, genetics and breeding, labor efficiency and predator control. But generally, some combination of the two, tying together production and marketing objectives of the farm into a strategic marketing plan, can help reduce cost and maximize returns. The strategic marketing plan can help producers “produce for a market” rather than to simply “market what they produce”.

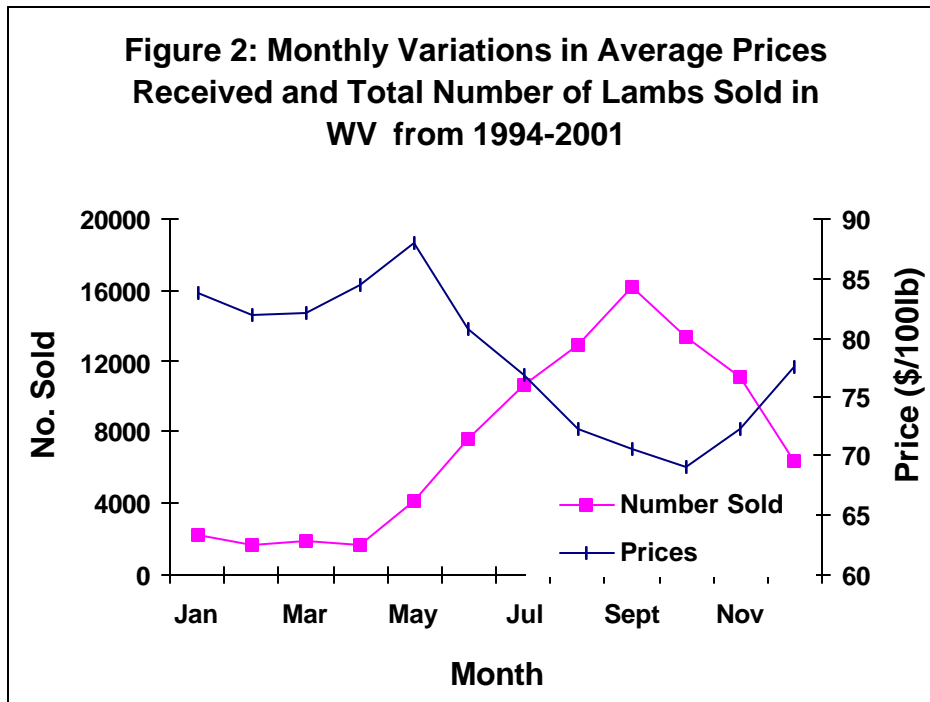
The first thing to consider is

been associated with lower predator and parasite losses.

A recent survey indicated that most producers in WV sell their lambs when they have a sufficient number of lambs ready for sale. Current prices and prices expectations were rated as the second and third most important factors affecting timing of lamb sales. While this probably reflects a calculated decision to sell when there are sufficient lambs to make the trip to market worthwhile, it also suggests that assembling a suitable lot size may mean having to forego peaks in prices. To overcome this weakness, small producers may consider synchronizing estrus (time of breeding) so that the majority of ewes lamb within a narrow window. This produces 1-2 uniform groups of lambs that can all be marketed together so that producers can receive price premiums for larger lots of uniform lambs.

Small producers might also consider pooling their lambs so that transportation costs are spread over more animals and the marketing cost to the individual producer is reduced. Pooling lambs can bring price premiums for larger lots. Marketing pools have been ranked by WV lamb producers as the primary marketing strategy of interest. So why not get involved in a lamb marketing pool with your neighbors and friends? The Extension Agent in your County and the WV Sheep Management Project (WVSMP) can help you coordinate this venture. Additionally, the WVSMP is contemplating setting up a Lamb Information Clearing House (LICH). The WV LICH would allow producers to provide information to buyers on the availability and the quantity and quality of lambs they are expected to have, and buyers can provide information to producers on the weight, age and quality of lambs they

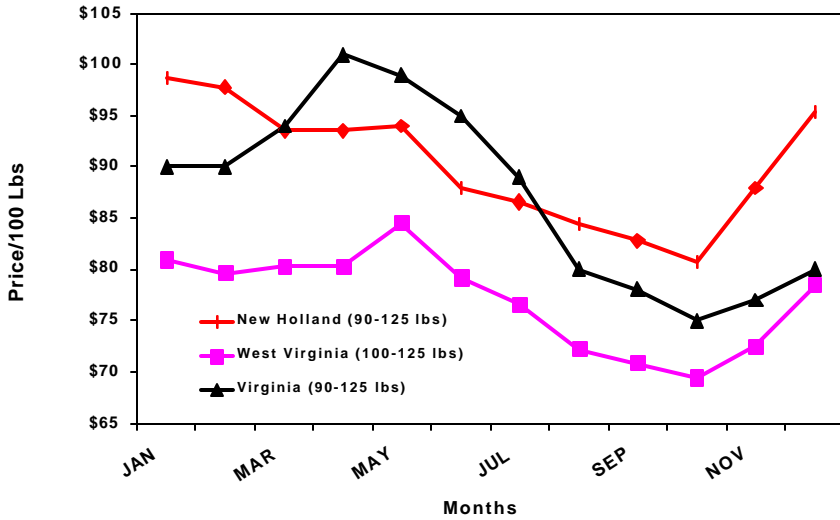
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ducer can do little to affect the overall price of lamb in the market, he does have a few marketing options that can allow him to strive for higher-than-average prices in the market at a given time. The possibilities for achieving higher-than-average prices include knowing when and where to sell lambs, and choosing the appropriate marketing method for your lambs. Alternatively, the producer can elect to

when to sell your lambs. Figure 2 shows that the spring and Easter markets are very attractive but the majority of producers cannot or have not oriented their production systems to capitalize on this period of higher prices. Producers may engage in fall or winter lambing programs, which can help better coordinate marketing age and weight with periods of higher prices. Fall lambing has also

Figure 3: Average Monthly Lamb Prices for WV, Virginia and New Holland (1994-1999)



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require. We hope this will not only lower overall marketing costs for the producer, but also improve direct communication between the lamb buyer and the producer to arrive at a better product in the marketplace, at a better price for you, the producer.

In the longer run, producers might consider increasing the size of the breeding flock. Given that the average breeding ewe flock size in WV is 39 head implies that most producers may either be operating at less than their capacity or have too small a size of operation/volume of production to be economically efficient. A larger scale of operation can increase profitability by reducing operating and marketing costs per ewe because fixed costs are spread over more production units; or by having a larger, more uniform lot of lambs to market and potentially avoid discounts for smaller, non-uniform lots.

Producers must also carefully consider where to sell their lambs. WV lamb producers sell their lambs at in-state and out-of-state auctions, or directly to livestock dealers. Data collected from lamb market sales at WV, Virginia and New Holland, PA livestock auctions show highest prices

during the spring and early summer months when fewer lambs are on the market. Prices for the same type of lamb were typically higher in Virginia and at New Holland than in WV (Figure 3). Choosing where to sell your lambs can result in higher prices even when overall market prices might be suppressed.

The individual small producer might not find it worthwhile to truck a few lambs to New Holland because the additional price might not be sufficient to compensate for increased transportation costs and shrinkage. Here again, small producers within the state can use lamb pools to reduce marketing costs per producer while seeking out higher-priced markets.

Alternatively, they can choose a marketing strategy that gives them more market power or control, such as niche marketing or forward contracting their smaller lots of lambs to specific market segments. This would necessitate knowledge of the specifications of the particular market and adaptation of production practices to cater to these specifications. However, the viability of these markets and the profitability associated with coordinating finish

weights and target market specifications make these marketing alternatives ideal to address unique considerations of the individual small producer.

Producers should also consider at what weights to sell their lambs. Examining WV lamb sale transactions from 1994-2001 indicates that during the period 1994-1997, highest prices were received for heavier slaughter lambs (100-125 and 85-100 lbs). After 1997, highest prices were observed for lighter feeder lambs (70-85 and <70 lbs), which suggest that a structural change in the WV lamb auction market occurred between 1994-1997 and 1998-2001 in the price-category relationship for slaughter and feeder lambs (Figure 4). This structural change could be attributed to: 1) changing consumers toward a leaner product for health reasons; 2) growth of the regional ethnic markets, which require a lighter, leaner carcass; and/or 3) response to increasing imports from New Zealand and Australia, which flooded the market with heavier carcasses in the >90 lbs range. Whatever the cause of the change, producers must alter production and marketing strategies to adapt to these industry changes in order to increase their competitiveness. Interestingly the majority of producers in WV continue to market their lambs between 91-105 lbs (Figure 5), seemingly ignoring the possibilities for higher prices at 70-85lbs. Producing lambs that meet these consumer requirements could contribute to producers' profitability by ensuring that supply matches demand.

One must also consider that price margins between categories of lamb sold will dictate profitability differences between lighter and heavier lambs. The producer must examine whether higher prices for lower-weight feeder lambs actually translate into higher profits compared with the relatively lower prices for heavier slaughter lambs.

Several other issues must be considered in addressing overall pro-

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duction cost control. Producers need to be aware that the efficient use of labor, especially at lambing time, affects their profit potential. The sheep flock is labor intensive at lambing time and most deaths in lambs occur in the first three days of life when they are in the lambing barn. Estrous synchronization can be used to consolidate labor at breeding and at lambing and potentially reduce mortality.

Genetic diversity also results in a lack of uniformity and inconsistency in product offerings, which makes it difficult to attract buyers to WV auctions or to pool lambs. Improvements in the genetic base of the breeding flock and choice of breeds can help producers produce uniform lots, as well as better match their product offerings with consumer specifications.

Figure 4: Mean Lamb Prices for Slaughter and Feeder Lambs in WV (1994-2001)

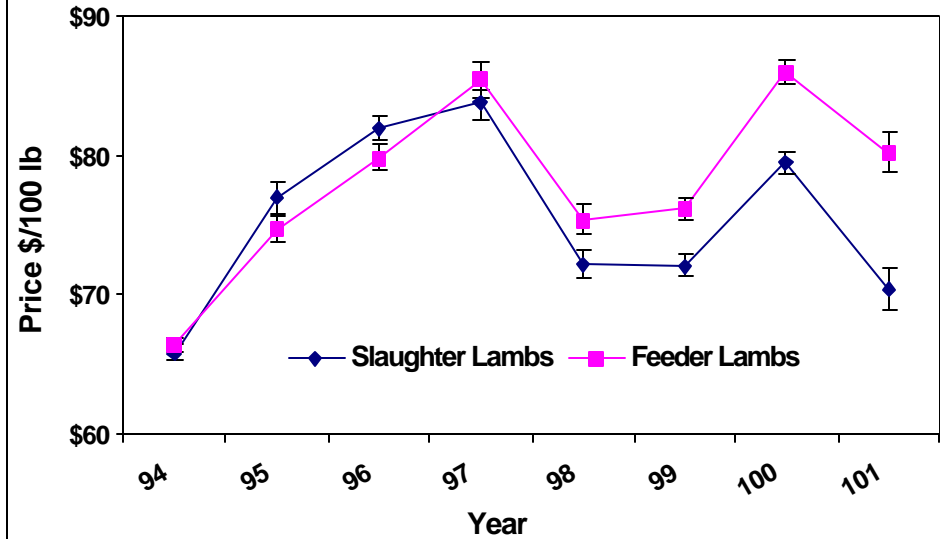
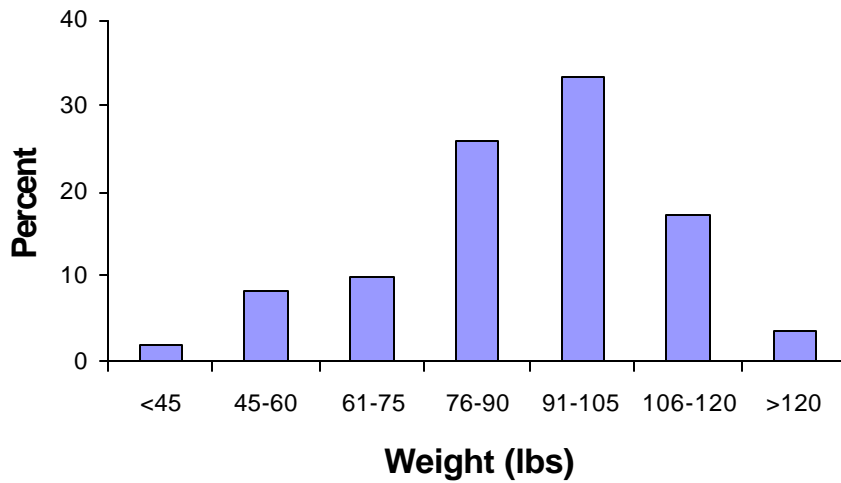


Figure 5. Distribution of Weight of Lambs Sold from WV



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Mark Your Calendars!!!

August 7: Penn State Performance Ram Test Sale, Rock Springs, Pa
Performance Ram Sale, Invitational ewe sale, Performance Tested buck Goat Sale, Invitational doe sale, Begins at 2:00

August 13-22: The State Fair of West Virginia, The State Fairgrounds, Fairlea, WV

August 28: WV-Ohio Sheep and Wool Festival, Jackson County Fairgrounds, (11th Annual) Cottageville, WV.