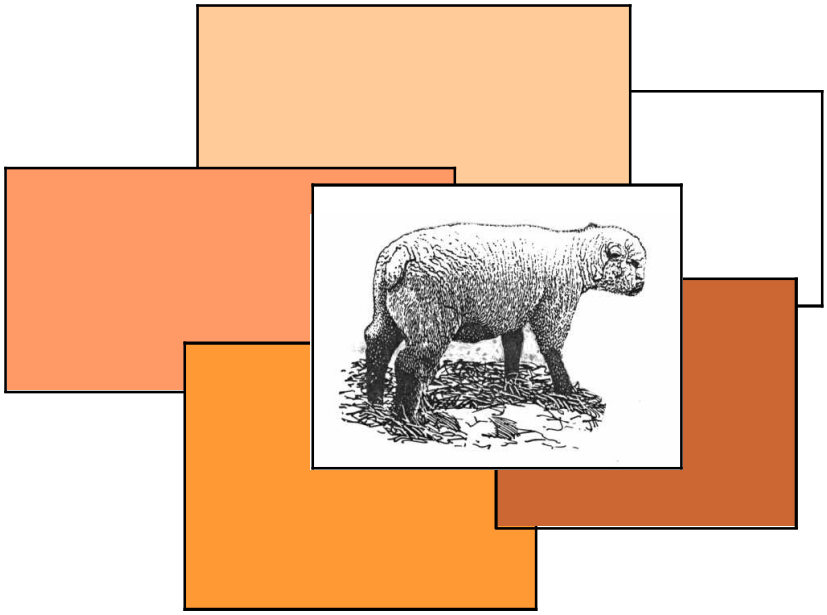
United States
Department
of Agriculture

Animal and
Plant Health
Inspection
Service

**Veterinary
Services**

# Reference of 1996 U.S. Sheep Health and Management Practices



**National Animal Health Monitoring System** **September 1996**

# Acknowledgements

This report has been prepared from material received and analyzed by the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS).

This study was a cooperative effort, and we would like to thank all participants for their efforts and dedication. The American Sheep Industry Association (ASI) co-sponsored the project. ASI's Animal Health Committee helped develop and deliver data collection materials and reviewed this and other reports resulting from the data. Personnel at the University of Minnesota and Colorado State University assisted in questionnaire development. The National Agricultural Statistics Service (NASS) conducted the sample selection, and the Colorado Agricultural Statistics Service prepared mailing labels and helped coordinate the mailing.

The participating producers were also critical in the success of this project. Their voluntary efforts made this study possible.

Dr. Al Strating, Director
Centers for Epidemiology & Animal Health

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# Introduction

The National Animal Health Monitoring System (NAHMS) is sponsored by the USDA:APHIS:Veterinary Services (VS). From 1989 through 1996, NAHMS conducted national studies of the swine, dairy cattle, beef cow/calf, and beef feedlot industries to obtain information on animal health and management.

In 1995, NAHMS collaborated with the Research and Education Division of the American Sheep Industry Association (ASI) in developing a needs assessment tool to identify the most important health and productivity factors for the sheep industry. The groups planned to use the resulting information to develop programs and projects to enhance the profitability of sheep.

For this sheep study, the USDA's National Agricultural Statistics Service (NASS) collaborated with VS to select a producer sample that was statistically designed to provide estimates for the United States sheep population (in the 48 contiguous states). The NAHMS/ASI questionnaires were mailed to 19,807 eligible sheep operations in January 1996 with postage-paid, return envelopes. A post card reminder was sent 4 weeks after the initial mailing. In addition, a 1-800 telephone number was provided so that participants could call with questions.

Data were summarized from 5,174 respondents.

This first report documenting the needs assessment study results was released in conjunction with a summary of regional study results, the *Reference of 1996 U.S. Regional Sheep Health and Managment Practices*.[1] Subsequent releases will discuss specific topics addressed by the study. All NAHMS sheep needs assessment results are available on the World Wide Web at http://www.aphis.usda.gov/vs/ceah.

For questions about this report or additional NAHMS results, please contact:

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1 Wording on table and figure headings in this report reflect that used on the questionnaire. Unless specifically indicated, respondents were not given further definitions or instructions on how to respond.

## Terms Used in This Report

**Flock size:** data throughout the report are often summarized by five size groupings or categories based on the total number of sheep and lambs on January 1, 1996, reported for each operation.

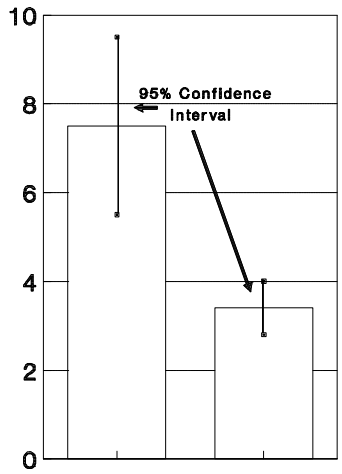
**Operation average:** a single value for each operation is summed over all operations reporting divided by the number of operations reporting. For instance, operation average percent of gross income is calculated by summing the reported percent over all operations then dividing by the number of operations.

**Percent operations**: number of operations with a given characteristic divided by the total number of operations.

**Percent sheep/lambs:** the sum of the actual number of sheep/lambs on each operation with a given characteristic divided by the total number of sheep on all operations. (**Percent sheep/lambs on operations:** an operation characteristic was applied to all sheep/lambs on the operation. The total number of sheep/lambs residing on operations with a given characteristic divided by the total sheep/lambs on all operations. See the example on page 3, percent of sheep on operations by expected change in inventory.)

**Primary breed category:** producers identified one primary breed category and all sheep and lambs on the operation were summarized in that category.

**Examples of 95% Confidence Intervals**




**(±1.0) (±0.3)**
**Standard Errors**
**#999a[1]**

**Population estimates:** averages and proportions weighted to represent the population. Most of the estimates in this report are provided with a measure of variability called the standard error and denoted by (±). Chances are 95 out of 100 that the interval created by the estimate plus or minus two standard errors will contain the true population value. In the example at right, an estimate of 7.5 with a standard error of ±1.0 results in a range of 5.5 to 9.5 (two times the standard error above and below the estimate.) The second estimate of 3.4 shows a standard error of ±0.3 results with a range of 2.8 and 4.0.

**Sample profile:** information that describes characteristics of the operations from which the data were collected.

[1] Identification numbers are assigned to each graph in this report for public reference.

# Part 1 - Section 1: Population Estimates

## A. Flock Management

1. Inventory and Expected Change by 2001.

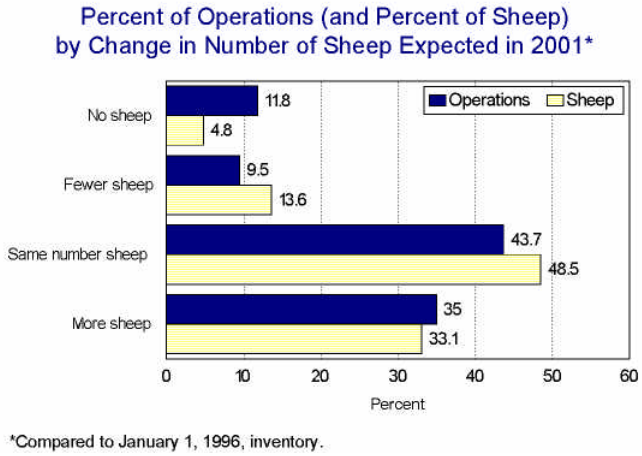
a. U.S. sheep and lamb inventory, January 1, 1996[1]:

| Category | Number Head | Totals |
|---|---|---|
| Breeding sheep 1 year or older: | | |
| Ewes | 5,125,100 | |
| Rams | 235,300 | |
| Replacement lambs | 863,100 | |
| Total breeding sheep and lambs | | 6,223,500 |
| Market sheep and lambs: | | |
| Sheep | 82,100 | |
| Lambs | 2,151,500 | |
| Total market sheep and lambs | | 2,233,600 |
| All sheep and lambs (50 states) | | 8,457,100 |
| All sheep and lambs (48 states) | | 8,433,400 |

| | Number |
|---|---|
| b. Operations with sheep in 1995[1] (50 states) | 82,120 |
| Operations with sheep in 1995 (48 contiguous states) | 82,040 |

c. Percent of operations (and percent of sheep on these operations) by number of sheep expected in 2001 compared to January 1, 1996, inventory:

| Expected Change | Percent Operations | Standard Error | Percent Sheep[2] | Standard Error |
|---|---|---|---|---|
| No sheep in 2001 | 11.8 | (± 0.8) | 4.8 | (± 0.5) |
| Fewer sheep in 2001 | 9.5 | (± 0.7) | 13.6 | (± 1.6) |
| Same number in 2001 | 43.7 | (± 1.2) | 48.5 | (± 2.6) |
| More sheep in 2001 | 35.0 | (± 1.1) | 33.1 | (± 2.4) |
| Total | 100.0 | | 100.0 | |

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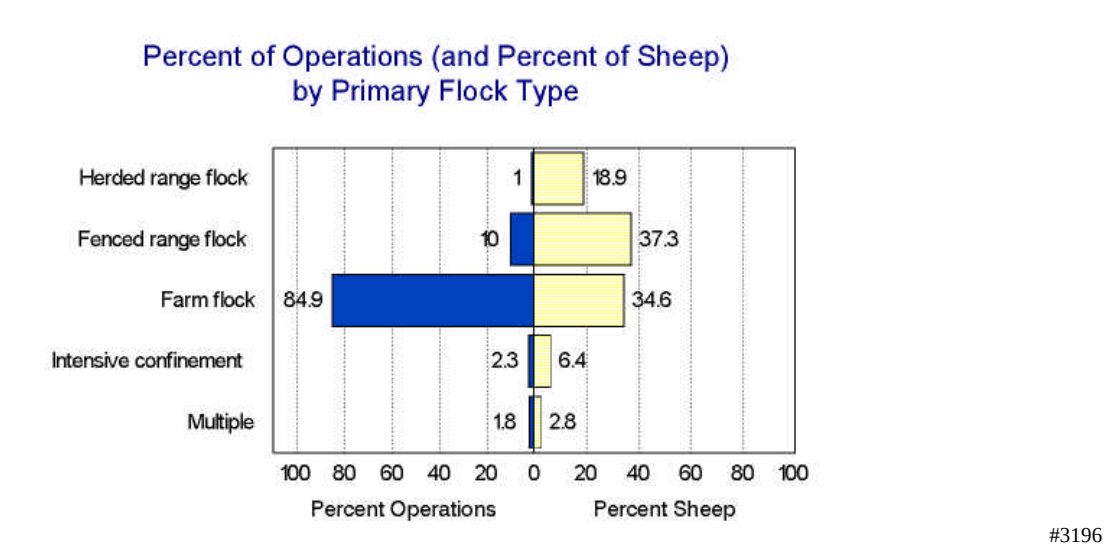
1 Source: USDA:National Agricultural Statistics Service (NASS.)

2 Refers to percent of total sheep and lambs as of January 1, 1996.

2. Primary Flock Type

a. Percent of operations (and percent of sheep on these operations) by primary flock type:

| Flock Type | Percent Operations | Standard Error | Percent Sheep | Standard Error |
|---|---|---|---|---|
| Herded range flock | 1.0 | (± 0.1) | 18.9 | (± 2.4) |
| Fenced range flock | 10.0 | (± 0.6) | 37.3 | (± 2.3) |
| Farm flock | 84.9 | (± 0.8) | 34.6 | (± 1.6) |
| Intensive confinement | 2.3 | (± 0.3) | 6.4 | (± 2.5) |
| Multiple[1] | 1.8 | (± 0.3) | 2.8 | (± 0.5) |
| Total | 100.0 | | 100.0 | |




3. Primary Breed

a. Percent of operations (and percent of sheep on these operations) by primary breed category:

| Breed Category | Percent Operations | Standard Error | Percent Sheep | Standard Error |
|---|---|---|---|---|
| Colored wool | 2.4 | (± 0.3) | 0.6 | (± 0.1) |
| Fine wool white face | 13.0 | (± 0.7) | 41.8 | (± 2.4) |
| Medium wool white face | 20.6 | (± 0.9) | 26.0 | (± 2.4) |
| Black face | 32.3 | (± 1.1) | 10.2 | (± 0.7) |
| Crossbred | 23.8 | (± 1.0) | 15.6 | (± 2.4) |
| Hair sheep | 1.0 | (± 0.3) | 0.4 | (± 0.1) |
| Milk sheep | 0.0 | (± 0.0) | 0.0 | (± 0.0) |
| Multiple | 6.9 | (± 0.6) | 5.4 | (± 0.7) |
| Total | 100.0 | | 100.0 | |

1 Producers selecting more than one category.

4. Production Records Used

a. Percent of operations by types of production records used to make decisions:

| Record Type | Percent Operations | Standard Error |
|---|---|---|
| Manual | 77.1 | (± 1.1) |
| Computerized | 10.8 | (± 0.7) |
| Other | 1.7 | (± 0.3) |
| None | 19.5 | (± 1.0) |

5. Source of Sheep Information

a. Percent of operations using each source for sheep information:

| Information Source | Percent Operations | Standard Error |
|---|---|---|
| SID Sheep Production Handbook | 24.1 | (± 0.9) |
| Other books | 50.5 | (± 1.2) |
| Magazines/Newsletters | 70.5 | (± 1.1) |
| Fairs/Shows | 42.3 | (± 1.2) |
| Meetings | 35.4 | (± 1.1) |
| Internet | 2.7 | (± 0.4) |
| University/Extension | 49.2 | (± 1.2) |
| Veterinarians | 63.3 | (± 1.1) |
| Feed and drug salesmen | 26.5 | (± 1.0) |
| Shearer | 49.5 | (± 1.2) |
| Other sheep producers | 69.4 | (± 1.1) |

6. Altered Management Practices

a. Percent of operations that altered the following management practices in the last 5 years due to animal welfare concerns:

| Practice | Percent Operations | Standard Error |
|---|---|---|
| Docking tails | 17.6 | (± 0.9) |
| Castration | 15.9 | (± 0.9) |
| Shearing | 14.7 | (± 0.8) |
| Disposal of dead animals and offal | 21.2 | (± 1.0) |
| Housing | 15.9 | (± 0.9) |
| Predator control | 18.8 | (± 0.9) |

## B. Births, Deaths, Culling, and Illness

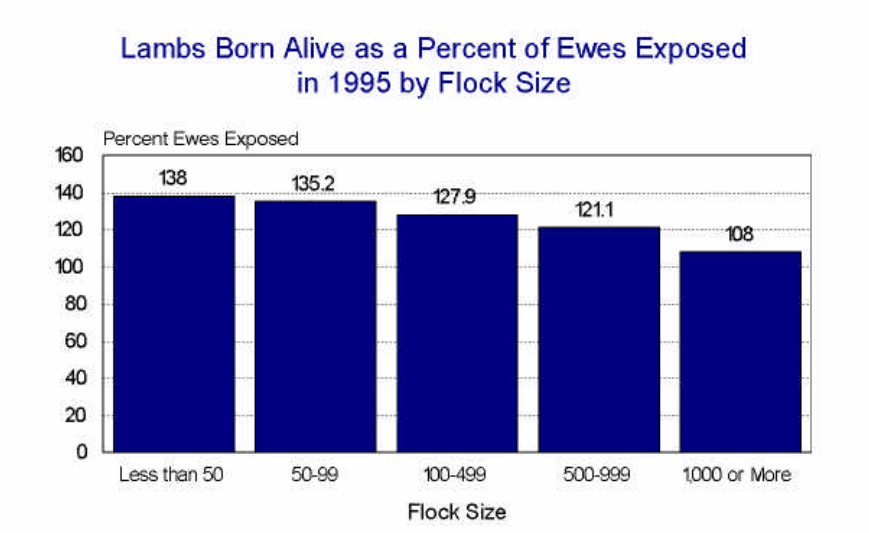
1. Productivity

a. Lamb outcomes as a percent of ewes exposed in 1995:

| Outcome | Percent Lambs | Standard Error |
|---|---|---|
| Aborted (at less than full term) | 1.8 | (± 0.1) |
| Born dead (full term) | 4.0 | (± 0.1) |
| Born alive | 121.3 | (± 1.2) |

i. Lamb outcomes as a percent of ewes exposed in 1995 by flock size:

| | Percent Lambs | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Sheep | | | | | | | | | |
| Outcome | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Aborted (at less than full term) | 1.5 | (± 0.1) | 1.9 | (± 0.2) | 2.1 | (± 0.2) | 1.4 | (± 0.2) | 1.8 | (± 0.3) |
| Born dead (full term) | 7.0 | (± 0.3) | 5.4 | (± 0.3) | 4.1 | (± 0.1) | 3.1 | (± 0.4) | 1.8 | (± 0.2) |
| Born alive | 138.0 | (± 1.4) | 135.2 | (± 2.8) | 127.9 | (± 2.2) | 121.1 | (± 3.9) | 108.0 | (± 2.1) |

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b. Of lambs born alive, percent that died before weaning:

| Percent Lambs | Standard Error |
|---|---|
| 9.4 | (± 0.3) |

i. Of lambs born alive, percent that died before weaning by flock size:

| | Percent Lambs | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Sheep | | | | | | | | | |
| Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| 11.1 | (± 0.6) | 8.0 | (± 0.5) | 8.3 | (± 0.4) | 9.2 | (± 1.1) | 9.6 | (± 0.7) |

2. Culling and Mortality

a. Sheep 1 year of age and older that left the flock in 1995 due to death or culling, as a percent of January 1, 1996, inventory (ewes and rams 1 year of age or older):

| Exit Reason | Percent Sheep | Standard Error |
|---|---|---|
| Cull | 16.1 | (± 2.0) |
| Died | 5.1 | (± 0.1) |
| Total | 21.2 | |

i. Sheep 1 year of age and older that left the flock in 1995 due to death or culling, as a percent of January 1, 1996, inventory (ewes and rams 1 year of age or older) by flock size:

| | Percent Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Exit Reason | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Were culled | 19.4 | (± 0.9) | 15.1 | (± 2.5) | 13.5 | (± 1.4) | 12.1 | (± 0.8) | 17.4 | (± 4.5) |
| Died | 8.3 | (± 0.5) | 5.7 | (± 0.4) | 4.9 | (± 0.2) | 3.5 | (± 0.2) | 4.3 | (± 0.2) |
| Total | 27.7 | | 20.8 | | 18.4 | | 15.6 | | 21.7 | |

b. Of sheep 1 year of age and older that were culled or died in 1995, percent culled or died by reason:

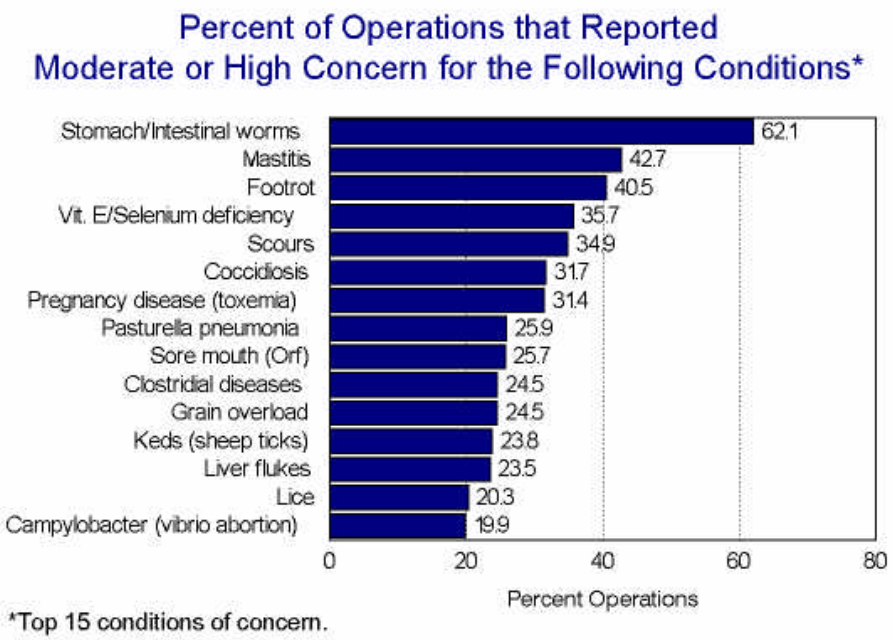
| Exit Reason | Percent Sheep | Standard Error |
|---|---|---|
| Mastitis | 4.4 | (± 0.5) |
| Poor udder/teat conformation | 1.9 | (± 0.3) |
| ‘Hard bag’ syndrome | 3.2 | (± 0.3) |
| Poor milk production | 2.4 | (± 0.3) |
| Teeth problems | 3.9 | (± 0.6) |
| Old age | 29.6 | (± 3.0) |
| Thin ewe | 4.2 | (± 0.8) |
| Failure to lamb (open, aborted) | 6.0 | (± 0.4) |
| Failure to wean (birthing problems, poor mothering, lambs died) | 2.8 | (± 0.4) |
| Other reproductive problems (low productivity, pregnancy disease, etc.) | 1.9 | (± 0.3) |
| Respiratory problems | 1.8 | (± 0.3) |
| Infectious footrot | 1.4 | (± 0.2) |
| Lameness, not footrot | 0.6 | (± 0.1) |
| Poor leg/feet conformation | 0.1 | (± 0.0) |
| Accidental injury | 1.1 | (± 0.1) |
| Predator | 7.7 | (± 0.9) |
| Behavioral faults | 0.4 | (± 0.1) |
| Poisoning | 0.9 | (± 0.1) |
| Ram breeding soundness | 0.5 | (± 0.2) |
| Economic | 16.2 | (± 8.2) |
| Other | 5.0 | (± 0.7) |
| Not reported | 4.0 | (± 0.7) |
| Total | 100.0 | |

3. Morbidity

a. Percent of operations that reported moderate or high concern[1] for the following conditions:

| Condition | Percent Operations | Standard Error |
|---|---|---|
| Chlamydia (enzootic abortion) | 18.1 | (± 0.8) |
| Campylobacter (vibrio abortion) | 19.9 | (± 0.8) |
| Toxoplasmosis abortion | 16.0 | (± 0.8) |
| Salmonellosis | 8.5 | (± 0.6) |
| Border disease (hairy shaker disease) | 5.1 | (± 0.5) |
| Bluetongue | 9.2 | (± 0.6) |
| Epididymitis (*B. ovis*) | 11.8 | (± 0.7) |
| Lamb epididymitis (Histomoniasis/Actinobacillus) | 8.4 | (± 0.6) |
| Scours | 34.9 | (± 1.1) |
| Cryptosporidiosis | 7.8 | (± 0.6) |
| Coccidiosis | 31.7 | (± 1.0) |
| Stomach/intestinal worms | 62.1 | (± 1.2) |
| Liver flukes | 23.5 | (± 1.0) |
| Pasteurella pneumonia | 25.9 | (± 1.0) |
| Sore mouth (Orf) | 25.7 | (± 1.0) |
| Clostridial diseases | 24.5 | (± 1.0) |
| Vitamin E/Selenium deficiency (white muscle disease) | 35.7 | (± 1.1) |
| Grain overload (rumen acidosis) | 24.5 | (± 1.0) |
| Polio (polioencephalomalacia) | 8.4 | (± 0.6) |
| Listeriosis (circling disease) | 9.3 | (± 0.7) |
| Pregnancy disease (toxemia) | 31.4 | (± 1.1) |
| Milk fever (hypocalcemia) | 19.1 | (± 0.9) |
| Mastitis | 42.7 | (± 1.2) |
| Caseous lymphadenitis (Cl, boils, abscess) | 16.8 | (± 0.8) |
| Ovine progressive penumonia (OPP) | 18.3 | (± 0.9) |
| Johne’s disease (paratuberculosis) | 7.7 | (± 0.6) |
| Bad teeth | 17.1 | (± 0.9) |
| Nutritional wasting | 17.0 | (± 0.8) |
| Scrapie | 18.4 | (± 0.9) |
| Footrot | 40.5 | (± 1.1) |
| Foot scald | 19.0 | (± 0.9) |
| Foot abscess | 15.3 | (± 0.8) |
| Lice | 20.3 | (± 0.9) |
| Keds (sheep ticks) | 23.8 | (± 0.9) |
| Fly strike | 16.9 | (± 0.8) |
| Copper toxicity | 14.9 | (± 0.8) |
| Plant toxicity | 13.4 | (± 0.8) |
| Genetic disorder | 10.9 | (± 0.7) |
| Other | 5.6 | (± 0.5) |

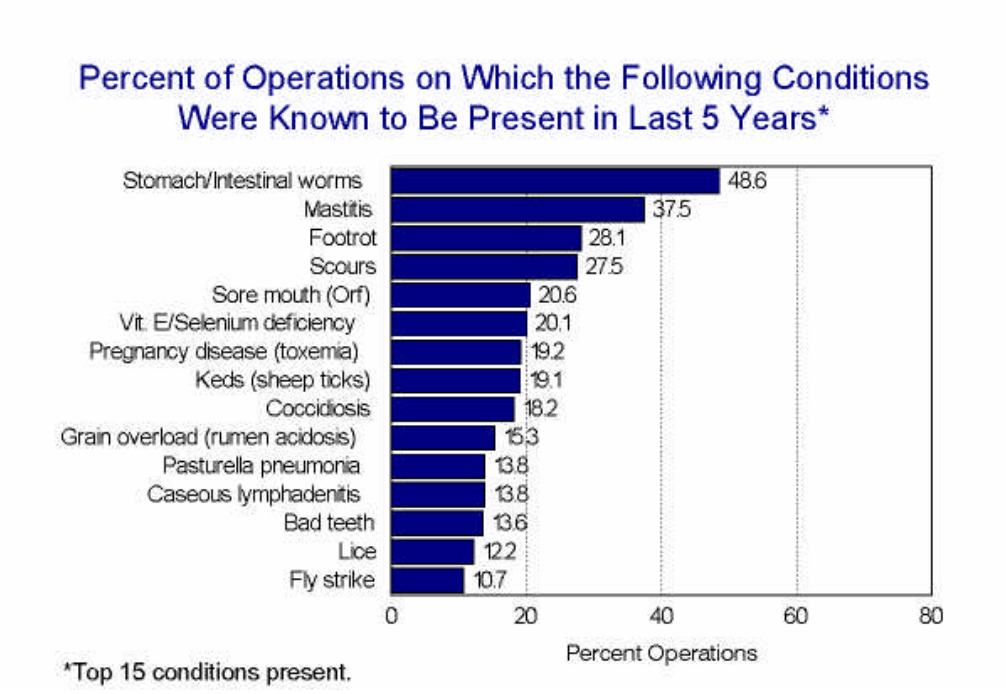
1 Respondents were asked to consider the overall potential effects on their flock and customers (on a four-point concern scale), regardless of whether the condition existed in their flock.


Percent of Operations that Reported
Moderate or High Concern for the Following Conditions*
Stomach/Intestinal worms 62.1
Mastitis 42.7
Footrot 40.5
Vit. E/Selenium deficiency 35.7
Scours 34.9
Coccidiosis 31.7
Pregnancy disease (toxemia) 31.4
Pasturella pneumonia 25.9
Sore mouth (Orf) 25.7
Clostridial diseases 24.5
Grain overload 24.5
Keds (sheep ticks) 23.8
Liver flukes 23.5
Lice 20.3
Campylobacter (vibrio abortion) 19.9
0
20
40
60
80
Percent Operations
*Top 15 conditions of concern.

#3198

b. Percent of operations on which the following conditions were known to be present (suspected or confirmed) in the previous 5 years:

| Condition | Percent Operations | Standard Error |
|---|---|---|
| Chlamydia (enzootic abortion) | 4.4 | (± 0.3) |
| Campylobacter (vibrio abortion) | 4.6 | (± 0.3) |
| Toxoplasmosis abortion | 3.3 | (± 0.4) |
| Salmonellosis | 1.0 | (± 0.1) |
| Border disease (hairy shaker disease) | 0.7 | (± 0.1) |
| Bluetongue | 2.6 | (± 0.3) |
| Epididymitis (*B. ovis*) | 1.5 | (± 0.1) |
| Lamb epididymitis (Histomoniasis/Actinobacillus) | 0.9 | (± 0.1) |
| Scours | 27.5 | (± 1.0) |
| Cryptosporidiosis | 1.0 | (± 0.1) |
| Coccidiosis | 18.2 | (± 0.8) |
| Stomach/intestinal worms | 48.6 | (± 1.2) |
| Liver flukes | 7.5 | (± 0.5) |
| Pasteurella pneumonia | 13.8 | (± 0.7) |
| Sore mouth (Orf) | 20.6 | (± 0.8) |
| Clostridial diseases | 9.8 | (± 0.6) |
| Vitamin E/Selenium deficiency (white muscle disease) | 20.1 | (± 0.9) |
| Grain overload (rumen acidosis) | 15.3 | (± 0.8) |
| Polio (polioencephalomalacia) | 3.0 | (± 0.3) |
| Listeriosis (circling disease) | 3.7 | (± 0.4) |
| Pregnancy disease (toxemia) | 19.2 | (± 0.8) |
| Milk fever (hypocalcemia) | 8.7 | (± 0.6) |
| Mastitis | 37.5 | (± 1.1) |
| Caseous lymphadenitis (Cl, boils, abscess) | 13.8 | (± 0.7) |
| Ovine progressive penumonia (OPP) | 5.1 | (± 0.4) |
| Johne’s disease (paratuberculosis) | 0.8 | (± 0.1) |
| Bad teeth | 13.6 | (± 0.7) |
| Nutritional wasting | 7.1 | (± 0.5) |
| Scrapie | 1.2 | (± 0.2) |
| Footrot | 28.1 | (± 1.0) |
| Foot scald | 10.6 | (± 0.6) |
| Foot abscess | 7.6 | (± 0.5) |
| Lice | 12.2 | (± 0.7) |
| Keds (sheep ticks) | 19.1 | (± 0.9) |
| Fly strike | 10.7 | (± 0.6) |
| Copper toxicity | 2.7 | (± 0.4) |
| Plant toxicity | 6.9 | (± 0.6) |
| Genetic disorder | 5.2 | (± 0.5) |
| Other | 3.6 | (± 0.5) |


Percent of Operations on Which the Following Conditions Were Known to Be Present in Last 5 Years*
Stomach/Intestinal worms 48.6
Mastitis 37.5
Footrot 28.1
Scours 27.5
Sore mouth (Orf) 20.6
Vit. E/Selenium deficiency 20.1
Pregnancy disease (toxemia) 19.2
Keds (sheep ticks) 19.1
Coccidiosis 18.2
Grain overload (rumen acidosis) 15.3
Pasturella pneumonia 13.8
Caseous lymphadenitis 13.8
Bad teeth 13.6
Lice 12.2
Fly strike 10.7
0
20
40
60
80
Percent Operations
*Top 15 conditions present.

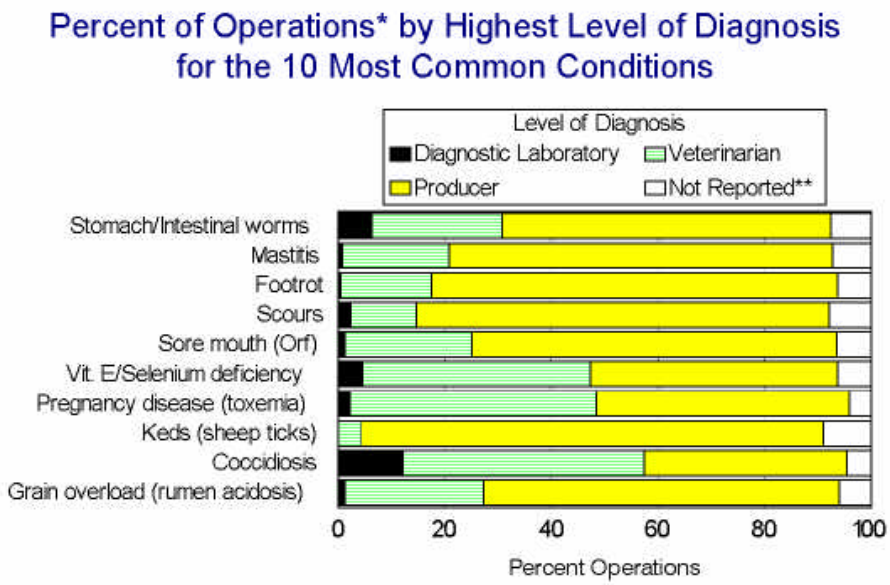
#3199

c. For operations that had the following conditions (suspected or confirmed) in the previous 5 years, percent of operations by the highest level[1] of diagnosis:

| | Percent Operations[2] | | | | | |
|---|---|---|---|---|---|---|
| Condition | Diagnostic Laboratory | Standard Error | Veterinarian | Standard Error | Producer | Standard Error |
| Chlamydia (enzootic abortion) | 23.2 | (± 2.5) | 31.6 | (± 3.6) | 40.0 | (± 4.0) |
| Campylobacter (vibrio abortion) | 21.7 | (± 2.5) | 31.0 | (± 3.5) | 43.2 | (± 3.7) |
| Toxoplasmosis abortion | 16.3 | (± 2.7) | 40.2 | (± 5.9) | 36.3 | (± 5.2) |
| Salmonellosis | 14.9 | (± 3.9) | 36.1 | (± 6.9) | 42.8 | (± 7.3) |
| Border disease (hairy shaker disease) | 12.0 | (± 3.9) | 27.8 | (± 9.4) | 56.5 | (± 8.7) |
| Bluetongue | 12.3 | (± 3.4) | 34.3 | (± 5.2) | 49.1 | (± 5.5) |
| Epididymitis (*B. ovis*) | 28.6 | (± 4.0) | 31.2 | (± 4.4) | 33.1 | (± 4.5) |
| Lamb epididymitis (Histomoniasis/Actinobacillus) | 7.0 | (± 3.3) | 22.6 | (± 6.1) | 54.5 | (± 8.8) |
| Scours | 2.4 | (± 0.4) | 12.3 | (± 1.3) | 77.5 | (± 1.8) |
| Cryptosporidiosis | 10.9 | (± 4.2) | 32.1 | (± 7.1) | 52.8 | (± 7.5) |
| Coccidiosis | 12.2 | (± 1.4) | 45.2 | (± 2.3) | 38.1 | (± 2.3) |
| Stomach/intestinal worms | 6.4 | (± 0.6) | 24.4 | (± 1.4) | 61.7 | (± 1.5) |
| Liver flukes | 6.0 | (± 2.0) | 33.8 | (± 3.6) | 49.9 | (± 3.8) |
| Pasteurella pneumonia | 6.4 | (± 1.3) | 38.2 | (± 2.9) | 48.5 | (± 2.8) |
| Sore mouth (Orf) | 1.3 | (± 0.4) | 23.9 | (± 1.9) | 68.3 | (± 2.1) |
| Clostridial diseases | 7.8 | (± 1.9) | 36.2 | (± 3.2) | 50.2 | (± 3.2) |
| Vitamin E/Selenium deficiency (white muscle disease) | 4.6 | (± 0.7) | 42.8 | (± 2.4) | 46.4 | (± 2.4) |
| Grain overload (rumen acidosis) | 1.4 | (± 0.4) | 25.9 | (± 2.4) | 66.7 | (± 2.6) |
| Polio (polioencephalomalacia) | 17.3 | (± 4.6) | 42.7 | (± 4.8) | 35.0 | (± 4.7) |
| Listeriosis (circling disease) | 6.0 | (± 1.9) | 43.7 | (± 5.5) | 45.6 | (± 5.0) |
| Pregnancy disease (toxemia) | 2.2 | (± 0.6) | 46.3 | (± 2.3) | 47.4 | (± 2.3) |
| Milk fever (hypocalcemia) | 1.4 | (± 0.6) | 34.1 | (± 3.6) | 57.4 | (± 3.6) |
| Mastitis | 0.9 | (± 0.2) | 20.0 | (± 1.5) | 71.9 | (± 1.6) |
| Caseous lymphadenitis (Cl, boils, abscess) | 2.7 | (± 0.6) | 19.3 | (± 1.9) | 73.7 | (± 2.1) |
| Ovine progressive penumonia (OPP) | 18.8 | (± 3.4) | 27.6 | (± 3.8) | 44.5 | (± 3.9) |
| Johne's disease (paratuberculosis) | 16.6 | (± 4.3) | 11.5 | (± 5.5) | 54.6 | (± 8.5) |
| Bad teeth | 0.0 | (± 0.0) | 2.8 | (± 0.8) | 88.7 | (± 1.8) |
| Nutritional wasting | 1.0 | (± 0.4) | 3.7 | (± 0.9) | 84.8 | (± 2.6) |
| Scrapie | 18.7 | (± 8.4) | 26.2 | (± 8.3) | 47.0 | (± 9.2) |
| Footrot | 0.6 | (± 0.2) | 16.9 | (± 1.5) | 76.2 | (± 1.7) |
| Foot scald | 0.9 | (± 0.5) | 17.6 | (± 2.4) | 72.8 | (± 2.7) |
| Foot abscess | 1.0 | (± 0.7) | 18.3 | (± 2.8) | 67.0 | (± 3.3) |
| Lice | 0.7 | (± 0.4) | 9.5 | (± 1.7) | 80.7 | (± 2.3) |
| Keds (sheep ticks) | 0.1 | (± 0.1) | 4.3 | (± 0.9) | 86.6 | (± 1.7) |
| Fly strike | 0.1 | (± 0.1) | 5.3 | (± 1.2) | 86.9 | (± 1.8) |
| Copper toxicity | 26.2 | (± 5.9) | 33.1 | (± 6.5) | 35.8 | (± 6.9) |
| Plant toxicity | 1.6 | (± 0.8) | 17.8 | (± 3.3) | 69.4 | (± 3.8) |
| Genetic disorder | 3.8 | (± 1.7) | 20.4 | (± 3.9) | 62.8 | (± 4.6) |
| Other | 9.8 | (± 2.9) | 23.9 | (± 5.2) | 54.1 | (± 6.4) |

1 Diagnostic laboratory was considered the highest level followed by a veterinarian, then producer.

2 Not all producers that had the condition in the previous 5 years identified who made the diagnosis.




*On operations where condition was known to be present in previous 5 years.
**Not all producers whose sheep had the condition in the previous 5 years identified who made the diagnosis.

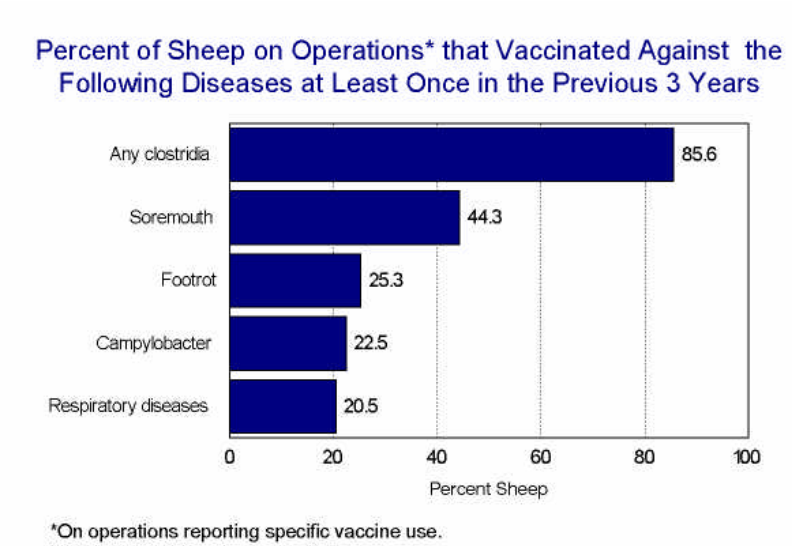
#3200

## C. Health Management

1. Vaccines

a. Percent of operations (and percent of sheep on these operations) by vaccines used at least once within the previous 3 years:

| Vaccine | Percent Operations | Standard Error | Percent Sheep | Standard Error |
|---|---|---|---|---|
| Clostridia C & D (overeating) | 58.7 | (± 1.2) | 77.7 | (± 1.5) |
| Clostridia CDT (tetanus) | 56.7 | (± 1.1) | 53.0 | (± 2.5) |
| Clostridia 7- or 8-way | 25.2 | (± 1.0) | 32.0 | (± 2.2) |
| Any clostridia | 72.8 | (± 1.1) | 85.6 | (± 1.3) |
| Soremouth | 14.8 | (± 0.8) | 44.3 | (± 2.3) |
| Chlamydia | 6.7 | (± 0.5) | 17.3 | (± 2.8) |
| Campylobacter (vibrio) | 12.3 | (± 0.7) | 22.5 | (± 2.1) |
| *E. coli* | 8.8 | (± 0.7) | 13.4 | (± 2.4) |
| Respiratory diseases | 14.6 | (± 0.8) | 20.5 | (± 2.7) |
| Bluetongue | 2.0 | (± 0.3) | 7.4 | (± 1.3) |
| Footrot | 17.0 | (± 0.8) | 25.3 | (± 2.8) |
| Caseous lymphadenitis | 2.5 | (± 0.3) | 5.7 | (± 2.0) |
| Other | 2.0 | (± 0.3) | 2.0 | (± 0.5) |




#3201

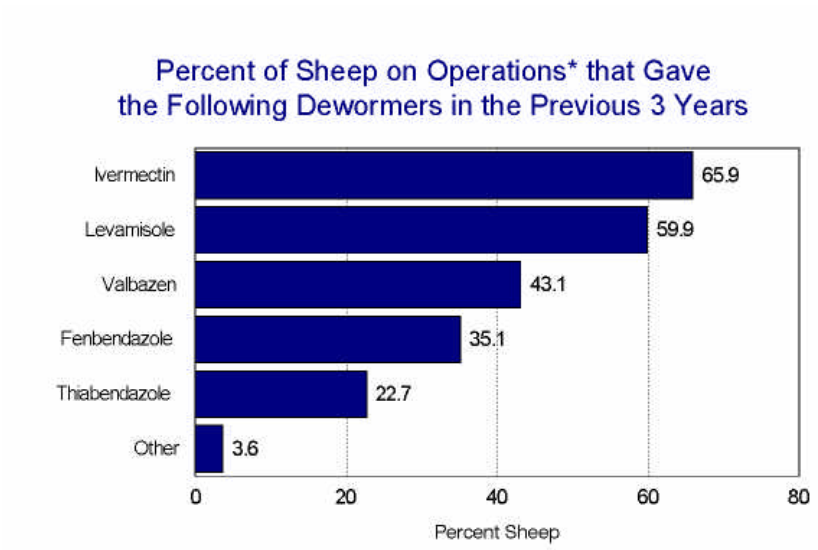
2. Dewormers

a. For operations that dewormed the following types of sheep, percent of operations by frequency of rotating dewormers:

| | Percent Operations | | | | | |
|---|---|---|---|---|---|---|
| Frequency | Lambs | Standard Error | Breeding Stock | Standard Error | Feeder Lambs | Standard Error |
| Not rotated | 47.3 | (± 1.3) | 32.4 | (± 1.2) | 45.8 | (± 1.5) |
| Less frequently than yearly | 12.3 | (± 0.9) | 14.7 | (± 0.9) | 13.6 | (± 1.0) |
| Yearly | 15.0 | (± 0.9) | 22.0 | (± 1.0) | 14.4 | (± 1.0) |
| More frequently than yearly | 25.4 | (± 1.1) | 30.9 | (± 1.1) | 26.2 | (± 1.3) |
| Total | 100.0 | | 100.0 | | 100.0 | |

b. Percent of operations (and percent of sheep on those operations) that used the following dewormers in the previous 3 years:

| Dewormer | Percent Operations | Standard Error | Percent Sheep | Standard Error |
|---|---|---|---|---|
| Ivermectin | 67.1 | (± 1.1) | 65.9 | (± 2.4) |
| Valbazen | 22.0 | (± 0.8) | 43.1 | (± 2.6) |
| Levamisole | 48.0 | (± 1.2) | 59.9 | (± 2.2) |
| Thiabendazole | 35.4 | (± 1.2) | 22.7 | (± 2.1) |
| Fenbendazole | 30.3 | (± 1.0) | 35.1 | (± 2.7) |
| Other | 4.0 | (± 0.5) | 3.6 | (± 0.5) |
| None | 8.3 | (± 0.7) | 7.7 | (± 0.9) |




#3202

* On operations reporting specific dewormer use.

3. Additives

a. Percent of operations that used the following additives in the previous 3 years:

| Additive | Percent Operations | Standard Error |
|---|---|---|
| Coccidiostats in feed or water | 21.0 | (± 0.8) |
| Antibiotics in feed or water | 35.0 | (± 1.1) |
| Growth promotants in feed or water | 6.3 | (± 0.5) |
| Hormone implants in lambs | 1.7 | (± 0.2) |

i. Percent of operations that used the following additives in the previous 3 years by flock size:

| | Percent Operations Number Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Additive | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Coccidiostats in feed or water | 16.6 | (± 1.1) | 32.2 | (± 2.1) | 36.8 | (± 1.7) | 34.9 | (± 3.9) | 25.9 | (± 2.4) |
| Antibiotics in feed or water | 30.1 | (± 1.4) | 49.2 | (± 2.4) | 51.0 | (± 2.0) | 45.4 | (± 4.1) | 47.1 | (± 2.8) |
| Growth promotants in feed or water | 5.3 | (± 0.7) | 9.6 | (± 1.3) | 9.2 | (± 0.9) | 9.6 | (± 1.9) | 9.4 | (± 1.5) |
| Hormone implants in lambs | 1.1 | (± 0.3) | 2.4 | (± 0.8) | 4.0 | (± 0.7) | 6.0 | (± 1.6) | 4.0 | (± 0.9) |

4. Reproductive management practices

a. Of operations that had at least one ewe, percent of operations by reproductive management practice used:

| Practice | Percent Operations | Standard Error |
|---|---|---|
| Breeding soundness exam | 20.5 | (± 0.9) |
| Out of season breeding | 21.8 | (± 0.9) |
| Accelerated lambing | 7.9 | (± 0.5) |
| Flushing | 54.7 | (± 1.2) |
| Use of teasers | 7.7 | (± 0.5) |
| Estrus synchronization | 3.3 | (± 0.3) |
| Artificial insemination | 1.2 | (± 0.2) |
| Embryo transfer | 0.2 | (± 0.1) |
| Ultrasound (pregnancy diagnosis, fetal counting) | 6.0 | (± 0.4) |

i. Percent of operations by reproductive management practice used and flock size:

| | Percent Operations Number Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Practice | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Breeding soundness exam | 15.6 | (± 1.1) | 31.2 | (± 2.1) | 35.5 | (± 1.7) | 48.5 | (± 3.5) | 51.4 | (± 3.0) |
| Out of season breeding | 18.8 | (± 1.1) | 30.4 | (± 2.1) | 33.3 | (± 1.7) | 25.2 | (± 3.9) | 22.9 | (± 2.5) |
| Accelerated lambing | 5.6 | (± 0.6) | 14.2 | (± 1.6) | 16.6 | (± 1.3) | 12.3 | (± 3.5) | 9.2 | (± 1.8) |
| Flushing | 48.6 | (± 1.5) | 72.7 | (± 2.3) | 73.0 | (± 1.9) | 76.9 | (± 2.7) | 68.4 | (± 2.8) |
| Use of teasers | 5.5 | (± 0.6) | 13.2 | (± 1.6) | 14.6 | (± 1.1) | 19.7 | (± 3.7) | 14.3 | (± 2.7) |
| Estrus synchronization | 2.2 | (± 0.4) | 5.9 | (± 1.1) | 6.8 | (± 0.7) | 6.3 | (± 1.4) | 7.3 | (± 1.8) |
| Artificial insemination | 0.8 | (± 0.3) | 2.7 | (± 1.0) | 2.6 | (± 0.5) | 2.6 | (± 1.0) | 2.5 | (± 0.9) |
| Embryo transfer | 0.1 | (± 0.1) | 1.1 | (± 0.8) | 0.2 | (± 0.1) | 0.7 | (± 0.4) | 1.4 | (± 0.7) |
| Ultrasound (pregnancy diagnosis, fetal counting) | 3.2 | (± 0.5) | 9.8 | (± 1.4) | 15.1 | (± 1.3) | 23.3 | (± 3.6) | 34.3 | (± 3.0) |

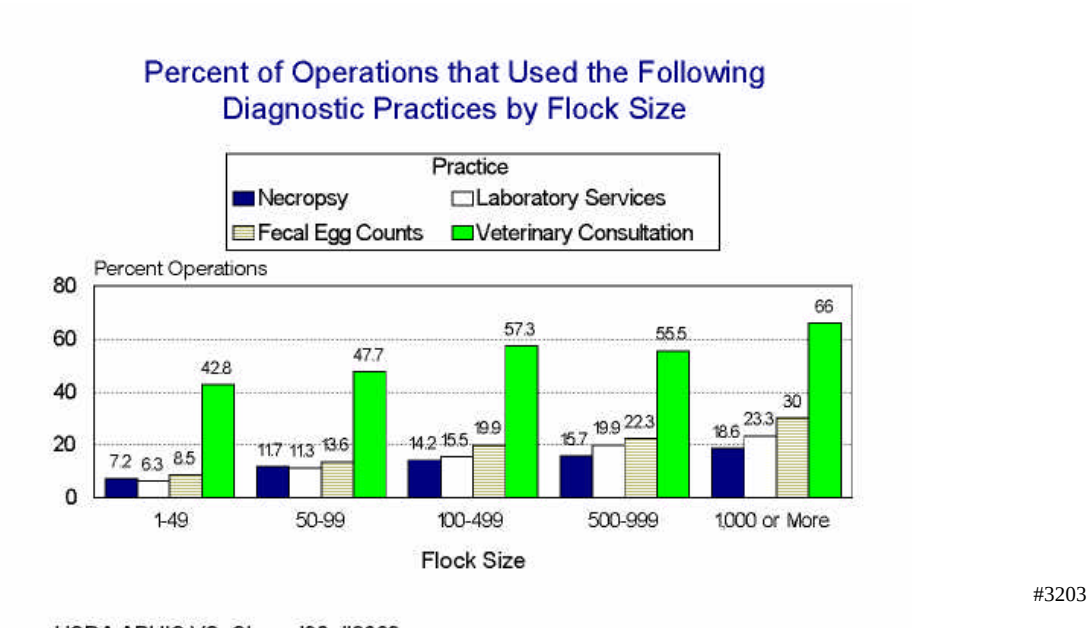
5. Diagnostic practices

a. Percent of operations that used the following diagnostic practices:

| Practice | Percent Operations | Standard Error |
|---|---|---|
| Necropsy | 8.8 | (± 0.6) |
| Laboratory services (serology, culture) | 8.3 | (± 0.5) |
| Fecal egg counts | 10.9 | (± 0.6) |
| Veterinary consultation | 45.5 | (± 1.2) |
| Other | 1.9 | (± 0.3) |

i. Percent of operations that used the following diagnostic practices by flock size:

| | Percent Operations Number Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Practice | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Necropsy | 7.2 | (± 0.7) | 11.7 | (± 1.4) | 14.2 | (± 1.1) | 15.7 | (± 3.7) | 18.6 | (± 2.2) |
| Laboratory services (serology, culture) | 6.3 | (± 0.7) | 11.3 | (± 1.3) | 15.5 | (± 1.1) | 19.9 | (± 3.8) | 23.3 | (± 2.3) |
| Fecal egg counts | 8.5 | (± 0.8) | 13.6 | (± 1.4) | 19.9 | (± 1.6) | 22.3 | (± 2.8) | 30.0 | (± 2.6) |
| Veterinary consultation | 42.8 | (± 1.5) | 47.7 | (± 2.4) | 57.3 | (± 1.9) | 55.5 | (± 4.1) | 66.0 | (± 2.5) |
| Other | 1.9 | (± 0.4) | 2.1 | (± 0.6) | 1.2 | (± 0.3) | 2.9 | (± 1.1) | 3.5 | (± 1.0) |



## D. Predator Management

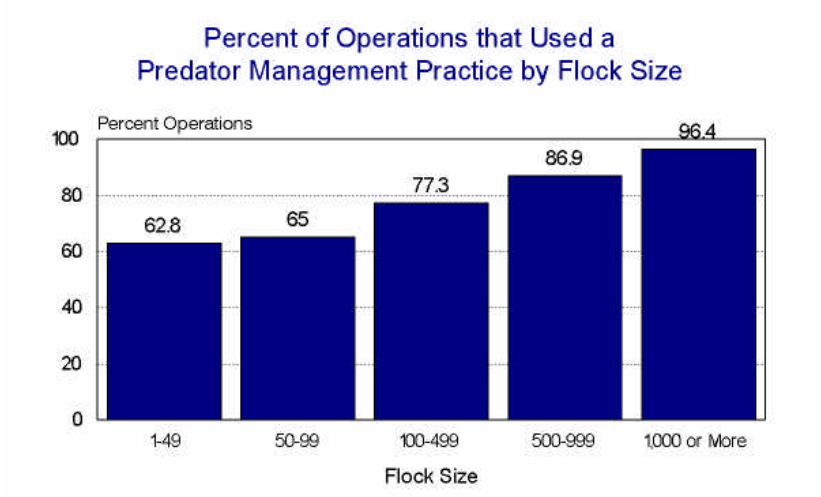
1. Use of any predator management practice

   a. Percent of operations that used any predator management practice:

| Percent Operations | Standard Error |
|---|---|
| 65.5 | (± 1.2) |

   i. Percent of operations that used a predator management practice by flock size:

| Percent Operations Number Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| 62.8 | (± 1.5) | 65.0 | (± 2.2) | 77.3 | (± 1.4) | 86.9 | (± 3.1) | 96.4 | (± 0.9) |




#3204

2. Specific predator management practices used

a. Of operations that used a predator management practice, percent that used the following practices:

i.

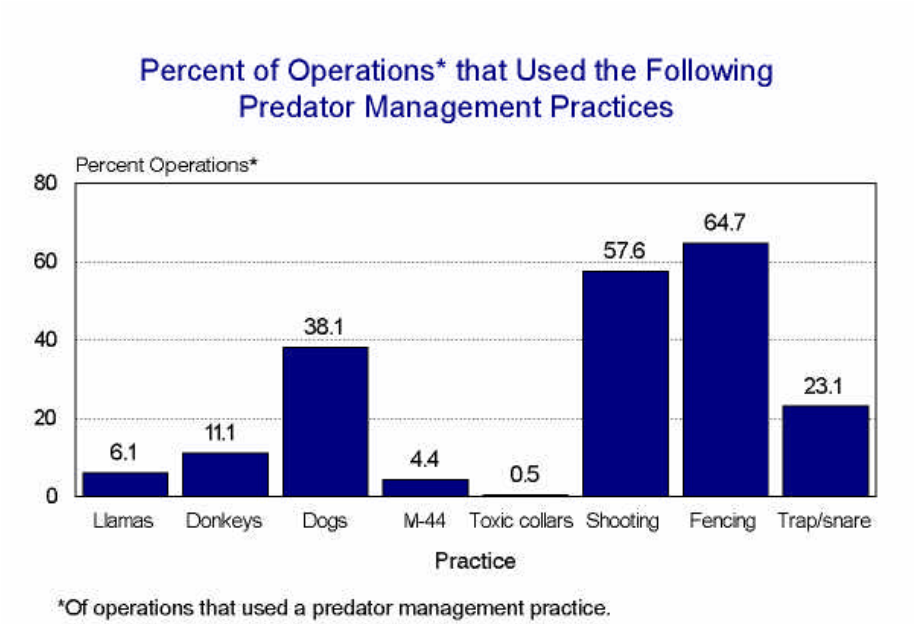
| Guardian Animals | Percent Operations | Standard Error |
|---|---|---|
| Llamas | 6.1 | (± 0.6) |
| Donkeys | 11.1 | (± 0.9) |
| Dogs | 38.1 | (± 1.4) |
| Any of the above | 51.2 | (± 1.5) |

ii.

| Lethal Methods | Percent Operations | Standard Error |
|---|---|---|
| M-44 | 4.4 | (± 0.3) |
| Toxic collars | 0.5 | (± 0.1) |
| Shooting | 57.6 | (± 1.4) |
| Any of the above | 61.9 | (± 1.5) |

iii.

| Other Methods | Percent Operations | Standard Error |
|---|---|---|
| Fencing | 64.7 | (± 1.4) |
| Trap/snare | 23.1 | (± 1.1) |
| Other[1] | 10.0 | (± 0.9) |

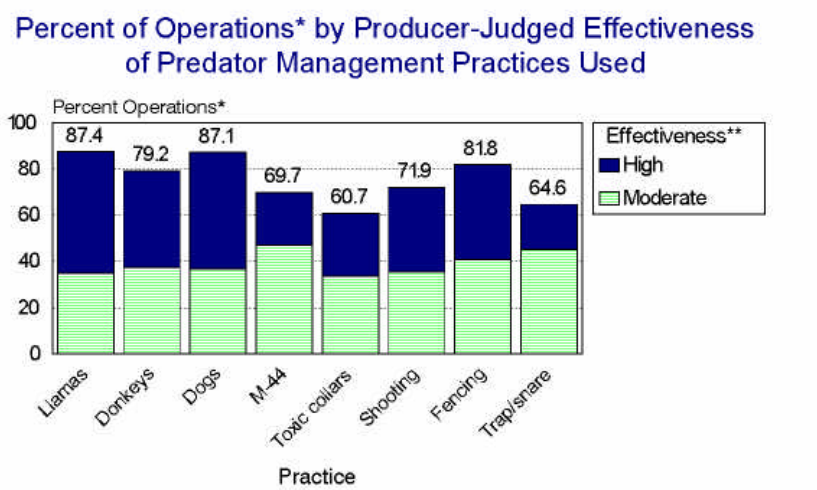



#3205

1 Includes penning at night, other guardian animals, lights and noises, and USDA:APHIS:Animal Damage Control.

b. Of operations that used the following predator management practices, percent of operations by producer-judged effectiveness:

| | Percent Operations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Not Effective | Standard Error | Low Effectiveness | Standard Error | Moderate Effectiveness | Standard Error | High Effectiveness | Standard Error | Total |
| i. Guardian Animals | | | | | | | | | |
| Llamas | 1.4 | (± 0.4) | 11.2 | (± 2.1) | 34.7 | (± 5.2) | 52.7 | (± 5.3) | 100.0 |
| Donkeys | 3.4 | (± 0.8) | 17.4 | (± 3.1) | 37.4 | (± 3.9) | 41.8 | (± 4.2) | 100.0 |
| Dogs | 1.0 | (± 0.4) | 11.9 | (± 1.5) | 36.6 | (± 2.2) | 50.5 | (± 2.3) | 100.0 |
| ii. Lethal Methods | | | | | | | | | |
| M-44 | 2.2 | (± 1.0) | 28.1 | (± 3.8) | 47.1 | (± 3.9) | 22.6 | (± 2.9) | 100.0 |
| Toxic collars | 7.0 | (± 3.6) | 32.3 | (± 6.9) | 33.7 | (± 6.4) | 27.0 | (± 6.7) | 100.0 |
| Shooting | 3.2 | (± 0.6) | 24.9 | (± 1.7) | 35.3 | (± 1.9) | 36.6 | (± 1.8) | 100.0 |
| iii. Other Methods | | | | | | | | | |
| Fencing | 3.1 | (± 0.5) | 15.1 | (± 1.2) | 40.8 | (± 1.9) | 41.0 | (± 1.9) | 100.0 |
| Trap/snare | 6.8 | (± 1.4) | 28.6 | (± 2.4) | 45.2 | (± 2.7) | 19.4 | (± 2.0) | 100.0 |
| Other | 2.4 | (± 1.7) | 3.7 | (± 1.2) | 27.7 | (± 4.2) | 66.2 | (± 4.5) | 100.0 |




*Of operations that used a predator management practice.
**Not shown: not effective or low effectiveness.

#3206

## E. Economics

1. Gross income

a. Operation average percent of gross income by category:

| Category | Operation Average | Standard Error |
|---|---|---|
| Slaughter lambs | 49.9 | (± 1.0) |
| Feeder lambs | 22.1 | (± 0.8) |
| Club lambs | 7.1 | (± 0.5) |
| Seedstock, purebred | 4.5 | (± 0.4) |
| Seedstock, commercial | 2.3 | (± 0.3) |
| Wool | 12.3 | (± 0.5) |
| Milk | 0.2 | (± 0.0) |
| Other | 1.6 | (± 0.2) |
| Total | 100.0 | |

i. Operation average percent of gross income by category and flock size:

| | Operation Average Percent Number Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Slaughter lambs | 51.7 | (± 1.4) | 48.1 | (± 1.9) | 45.8 | (± 1.4) | 32.9 | (± 2.7) | 33.2 | (± 2.0) |
| Feeder lambs | 20.8 | (± 1.1) | 21.6 | (± 1.6) | 25.1 | (± 1.3) | 38.7 | (± 2.9) | 39.7 | (± 1.8) |
| Club lambs | 7.4 | (± 0.7) | 8.2 | (± 1.1) | 6.0 | (± 1.0) | 1.9 | (± 0.6) | 0.8 | (± 0.3) |
| Seedstock, purebred | 4.2 | (± 0.5) | 6.7 | (± 1.0) | 5.2 | (± 0.5) | 1.8 | (± 0.4) | 0.7 | (± 0.2) |
| Seedstock, commercial | 2.3 | (± 0.5) | 2.0 | (± 0.3) | 2.3 | (± 0.3) | 2.7 | (± 0.9) | 4.4 | (± 0.9) |
| Wool | 11.9 | (± 0.6) | 11.6 | (± 0.7) | 13.8 | (± 0.5) | 17.8 | (± 1.0) | 19.4 | (± 0.7) |
| Milk | 0.2 | (± 0.1) | 0.1 | (± 0.1) | 0.1 | (± 0.0) | 0.4 | (± 0.2) | 0.4 | (± 0.2) |
| Other | 1.5 | (± 0.3) | 1.7 | (± 0.5) | 1.7 | (± 0.3) | 3.8 | (± 0.8) | 1.4 | (± 0.3) |
| Total | 100.0 | | 100.0 | | 100.0 | | 100.0 | | 100.0 | |

b. Percent of operations that received any income from each category:

| Category | Percent Operations | Standard Error |
|---|---|---|
| Slaughter lambs | 71.5 | (± 1.1) |
| Feeder lambs | 39.6 | (± 1.2) |
| Club lambs | 20.1 | (± 1.0) |
| Seedstock, purebred | 14.4 | (± 0.8) |
| Seedstock, commercial | 11.8 | (± 0.8) |
| Wool | 76.6 | (± 1.1) |
| Milk | 1.2 | (± 0.3) |
| Other | 5.5 | (± 0.5) |

i. Percent of operations that received any income from each category by flock size:

| | Percent Operations Number Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Slaughter lambs | 72.5 | (± 1.5) | 74.9 | (± 2.2) | 68.7 | (± 1.8) | 49.9 | (± 3.5) | 49.7 | (± 2.6) |
| Feeder lambs | 36.9 | (± 1.6) | 42.2 | (± 2.4) | 46.5 | (± 1.9) | 64.7 | (± 3.9) | 67.4 | (± 2.4) |
| Club lambs | 19.9 | (± 1.3) | 26.0 | (± 2.1) | 18.7 | (± 1.7) | 8.6 | (± 1.8) | 8.1 | (± 2.3) |
| Seedstock, purebred | 13.0 | (± 1.1) | 21.6 | (± 1.9) | 18.1 | (± 1.3) | 9.7 | (± 1.8) | 6.0 | (± 1.2) |
| Seedstock, commercial | 10.2 | (± 1.0) | 15.5 | (± 1.7) | 16.1 | (± 1.2) | 14.2 | (± 3.2) | 24.1 | (± 2.6) |
| Wool | 71.8 | (± 1.5) | 86.6 | (± 1.6) | 92.1 | (± 1.3) | 92.4 | (± 2.5) | 95.7 | (± 0.9) |
| Milk | 1.3 | (± 0.3) | 0.6 | (± 0.2) | 0.9 | (± 0.3) | 3.0 | (± 1.2) | 1.6 | (± 0.6) |
| Other | 4.9 | (± 0.7) | 7.1 | (± 1.3) | 6.2 | (± 0.8) | 14.1 | (± 3.2) | 8.0 | (± 1.4) |

2. Profitability limitations

a. Percent of operations by categories that limited profitability:

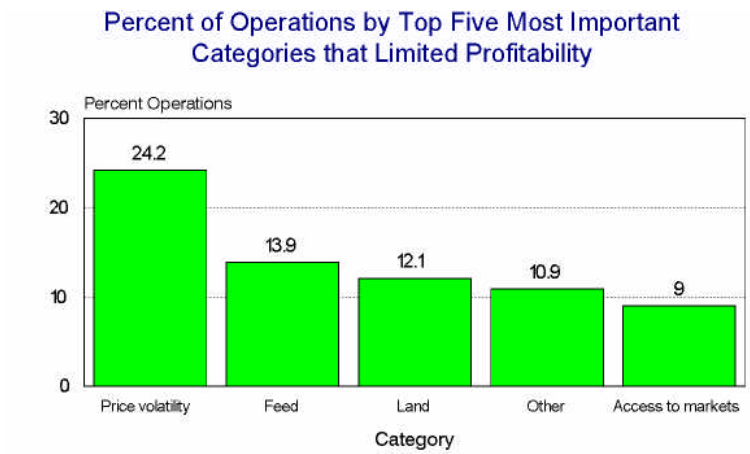
| Category | Percent Operations | Standard Error |
|---|---|---|
| Capital (debt) | 21.1 | (± 0.9) |
| Labor | 26.8 | (± 1.0) |
| Land | 35.2 | (± 1.2) |
| Feed | 42.9 | (± 1.2) |
| Availability of sheep | 8.3 | (± 0.6) |
| Breed of sheep | 6.4 | (± 0.6) |
| Family succession | 7.6 | (± 0.6) |
| Government regulations | 19.9 | (± 0.9) |
| Access to markets | 30.8 | (± 1.1) |
| Price volatility | 50.0 | (± 1.2) |
| Operator interest and enthusiasm | 18.5 | (± 1.0) |
| Other | 15.2 | (± 0.9) |

i. Percent of operations by categories that limited profitability and flock size:

| | Percent Operations Number Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Capital (debt) | 17.8 | (± 1.1) | 27.1 | (± 2.2) | 31.8 | (± 1.9) | 37.2 | (± 3.3) | 46.9 | (± 2.9) |
| Labor | 22.7 | (± 1.2) | 32.4 | (± 2.2) | 40.7 | (± 2.0) | 48.0 | (± 4.1) | 61.0 | (± 2.7) |
| Land | 33.7 | (± 1.5) | 38.5 | (± 2.3) | 39.5 | (± 1.8) | 48.7 | (± 3.5) | 41.7 | (± 2.9) |
| Feed | 40.9 | (± 1.5) | 46.9 | (± 2.4) | 48.6 | (± 2.0) | 53.1 | (± 4.1) | 59.6 | (± 2.7) |
| Availability of sheep | 7.4 | (± 0.8) | 11.3 | (± 1.5) | 10.0 | (± 1.3) | 9.8 | (± 2.4) | 15.4 | (± 2.3) |
| Breed of sheep | 5.9 | (± 0.7) | 9.4 | (± 1.5) | 6.7 | (± 0.9) | 4.6 | (± 1.2) | 6.7 | (± 1.7) |
| Family succession | 6.9 | (± 0.7) | 10.7 | (± 1.5) | 7.2 | (± 0.8) | 10.4 | (± 2.0) | 14.5 | (± 2.0) |
| Government regulations | 15.9 | (± 1.1) | 23.7 | (± 2.0) | 31.1 | (± 2.0) | 50.8 | (± 4.1) | 71.3 | (± 2.4) |
| Access to markets | 30.2 | (± 1.4) | 29.9 | (± 2.1) | 33.6 | (± 1.9) | 36.6 | (± 4.0) | 43.3 | (± 2.9) |
| Price volatility | 45.3 | (± 1.6) | 56.7 | (± 2.3) | 65.3 | (± 1.9) | 80.6 | (± 2.6) | 83.8 | (± 1.8) |
| Operator interest and enthusiasm | 19.9 | (± 1.2) | 16.8 | (± 1.8) | 13.2 | (± 1.2) | 9.4 | (± 2.0) | 14.4 | (± 2.5) |
| Other | 15.3 | (± 1.2) | 13.6 | (± 1.4) | 14.1 | (± 1.3) | 20.8 | (± 3.7) | 22.3 | (± 2.1) |

b. Percent of operations by most important category that limited profitability:

| Category | Percent Operations | Standard Error |
|---|---|---|
| Capital (debt) | 6.2 | (± 0.6) |
| Labor | 5.8 | (± 0.6) |
| Land | 12.1 | (± 1.0) |
| Feed | 13.9 | (± 0.9) |
| Availability of sheep | 1.6 | (± 0.3) |
| Breed of sheep | 0.7 | (± 0.2) |
| Family succession | 1.3 | (± 0.3) |
| Government regulations | 4.2 | (± 0.5) |
| Access to markets | 9.0 | (± 0.9) |
| Price volatility | 24.2 | (± 1.1) |
| Operator interest and enthusiasm | 6.2 | (± 0.7) |
| Other | 10.9 | (± 0.9) |
| Multiple | 3.9 | (± 0.5) |
| Total | 100.0 | |




#3207

i. Percent of operations by most important category that limited profitability by flock size:

| | Percent Operations Number Sheep | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Less than 50 | Standard Error | 50-99 | Standard Error | 100-499 | Standard Error | 500-999 | Standard Error | 1,000 or More | Standard Error |
| Capital (debt) | 5.5 | (± 0.8) | 8.3 | (± 1.4) | 7.7 | (± 1.0) | 10.4 | (± 2.3) | 7.0 | (± 1.7) |
| Labor | 4.9 | (± 0.7) | 6.6 | (± 1.1) | 10.5 | (± 1.5) | 8.5 | (± 2.4) | 7.1 | (± 1.4) |
| Land | 13.0 | (± 1.3) | 13.1 | (± 1.9) | 7.6 | (± 1.0) | 6.4 | (± 1.7) | 3.1 | (± 1.1) |
| Feed | 14.3 | (± 1.2) | 14.7 | (± 1.8) | 12.3 | (± 1.4) | 10.4 | (± 3.7) | 5.8 | (± 1.3) |
| Availability of sheep | 1.5 | (± 0.4) | 2.2 | (± 0.8) | 1.3 | (± 0.4) | 1.3 | (± 0.6) | 0.8 | (± 0.3) |
| Breed of sheep | 0.7 | (± 0.3) | 1.1 | (± 0.7) | 0.5 | (± 0.2) | 0.5 | (± 0.5) | 0.0 | (± 0.0) |
| Family succession | 1.5 | (± 0.4) | 1.1 | (± 0.6) | 0.2 | (± 0.1) | 1.3 | (± 0.9) | 0.3 | (± 0.2) |
| Government regulations | 3.8 | (± 0.7) | 3.6 | (± 0.8) | 4.6 | (± 0.7) | 10.3 | (± 2.2) | 12.0 | (± 1.7) |
| Access to markets | 9.5 | (± 1.1) | 6.8 | (± 1.2) | 9.5 | (± 1.6) | 6.6 | (± 3.5) | 2.9 | (± 1.0) |
| Price volatility | 22.3 | (± 1.4) | 27.2 | (± 2.4) | 30.8 | (± 1.9) | 29.7 | (± 4.7) | 37.3 | (± 2.9) |
| Operator interest and enthusiasm | 7.8 | (± 1.0) | 2.8 | (± 0.9) | 1.6 | (± 0.5) | 0.0 | (± 0.0) | 0.0 | (± 0.0) |
| Other | 11.4 | (± 1.2) | 9.3 | (± 1.4) | 9.3 | (± 1.4) | 7.3 | (± 1.7) | 14.7 | (± 1.9) |
| Multiple | 3.8 | (± 0.6) | 3.2 | (± 0.9) | 4.1 | (± 0.7) | 7.3 | (± 1.9) | 9.0 | (± 2.0) |
| Total | 100.0 | | 100.0 | | 100.0 | | 100.0 | | 100.0 | |

# Section II: Sample Profile for Reporting Operations

## A. Flock Size

1. Number of reporting operations by number of ewes present on January 1, 1996:

| Number Ewes | Number Operations |
|---|---|
| 0 | 1,072 |
| 1-49 | 2,050 |
| 50-99 | 788 |
| 100-499 | 827 |
| 500 or more | 405 |
| Not reported | 32 |
| Total | 5,174 |

2. Number of reporting operations by total sheep inventory present on January 1, 1996:

| Number Sheep | Number Operations |
|---|---|
| 0 | 1,003 |
| 1-49 | 1,773 |
| 50-99 | 788 |
| 100-499 | 1,062 |
| 500-999 | 222 |
| 1,000 or more | 324 |
| Not reported | 2 |
| Total | 5,174 |

## B. Type of Operation

1. Number of reporting operations by type:

| Type | Number Operations |
|---|---|
| Herded range flock | 121 |
| Fenced range flock | 645 |
| Farm flock | 3,200 |
| Intensive confinement | 111 |
| Multiple | 81 |
| Not specified | 1,016 |
| Total | 5,174 |

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