

# Animal science and veterinary student perception of farm animal welfare practices

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## Abstract

This study was part of a larger study conducted by Texas AgriLife Extension Service surveying livestock producers, livestock market employees, and students studying animal agriculture to determine their perceptions of animal agriculture's animal welfare practices as well as their understanding of Beef Quality Assurance (BQA). This paper focuses on students engaged in the study of production animal agriculture.

To identify students' overall perception of animal welfare in production agriculture, five constructs were developed. The five constructs of animal welfare used in this study were: 1) production agriculture; 2) production methods; 3) attitudes toward animals in general; 4) attitudes toward animals in production agriculture; and 5) production practices. In addition, students were surveyed to assess their basic knowledge of BQA practices.

Overall, results indicated that students felt production agriculture was doing a good job as it relates to animal welfare, with favorable attitudes toward current animal agriculture production practices. Student responses to the BQA-related questions indicated a lack of knowledge of BQA principles.

**Key words:** BQA, animal welfare, student survey

## Résumé

La présente étude s'inscrit dans une recherche plus vaste entreprise par le service de vulgarisation AgriLife du Texas (Texas AgriLife Extension Service) sur la perception des pratiques de bien-être animal et la compréhension du programme Beef Quality Assurance (BQA) auprès des éleveurs de bovins, des employés de

marché de bovins et des étudiants en production animale. Cet article porte particulièrement sur les réponses apportées par ces derniers.

Ainsi, nous avons cherché à déterminer la perception globale qu'ont les étudiants du bien-être animal dans les élevages agricoles, suivant différents volets : 1) la production agricole, 2) les méthodes de production, 3) l'attitude envers les animaux en général, 4) l'attitude envers les animaux dans les élevages agricoles et 5) les pratiques d'élevage. De plus, nous avons examiné la connaissance de base des étudiants en ce qui concerne les pratiques du programme BQA.

Selon les résultats obtenus, les étudiants considèrent que les pratiques agricoles respectent les règles du bien-être animal et voient d'un bon œil les pratiques actuelles dans les élevages agricoles. Toutefois, les réponses des étudiants aux questions sur le programme BQA révèlent un certain manque de connaissances des principes de ce programme.

## Introduction

Historically, agricultural uses have been the main reason for keeping and domesticating animals.<sup>17</sup> Humans and animals shared a symbiotic relationship, with animals furnishing the labor, transportation, food, or fiber, and humans providing nutrition and shelter from predators and the elements.<sup>17</sup> The traditional ethic forbade "cruelty to animals", that is, "deliberate, sadistic, useless, unnecessary infliction of pain, suffering, and neglect on animals".<sup>17</sup> Man's interests were served by insuring the welfare of his animals, and an ethic of "husbandry" was established. Significant use of animals for research and testing is a relatively modern concept developed within the last century.<sup>17</sup> It was not

until the 1980s that animal welfare began developing as a scientific discipline.<sup>3</sup> Johnson states, “There are three schools (characterizations) of animal welfare, and which characterization an individual subscribes to will often influence the philosophical definitions of welfare to which they subscribe”.<sup>11</sup> The first characterization is feeling-based and deals with how animals perceive pleasure, suffering, distress, and pain; the second characterization focuses on the fitness and health of the animal; and the third characterization emphasizes animals expressing natural behavior under natural conditions.<sup>11,19</sup>

The public’s perception of animal agriculture’s attitude toward animal welfare is ranked as “one of the three major challenges facing production agriculture today”.<sup>17</sup> It is generally recognized that more than 95% of the US population is at least three generations removed from the farm, and today’s consumers have little understanding of agricultural animal practices.<sup>2,17</sup> Definitions including “free range”, “organic”, “natural”, and even “grass fed”, elicit different images from different groups. For example, some consumers in the United Kingdom perceived a close relationship between organically raised animals and animal welfare, while others thought there was a closer association between free-range production systems and animal welfare.<sup>9</sup> Interestingly, consumers surveyed in the UK believed animals in a “free range” production system resulted in a safer food product.<sup>9</sup>

As evidence of increasing public concern, politicians in the United Kingdom claim they receive more mail concerning animal welfare than any other issue, and during the 1980s and 1990s the US Congress received more letters about animal welfare-related issues than any other issues.<sup>3,17</sup> As further evidence of international concern, Chinese university students indicated a “strong concern for the treatment of animals across a broad spectrum of issues”.<sup>6</sup> A recent consumer survey found 56% of respondents believed decisions relating to farm animal welfare should be made by “experts rather than based on views of the public”.<sup>14</sup> The survey also found 54% of respondents felt decisions about farm animal welfare should be based on scientific considerations as opposed to moral and ethical considerations, as opposed to the 46% of respondents who believed that animal welfare was strictly a moral issue and unrelated to science.<sup>14</sup> More than 60% of the respondents also believe the government should take an active role in the promotion of animal welfare.<sup>14</sup>

Additionally, a 2003 Gallup poll found 76% of those surveyed opposed banning all types of hunting, 64% opposed banning medical research on laboratory animals, 61% opposed banning product testing on laboratory animals, while 62% favored passing strict laws concerning the treatment of farm animals.<sup>7</sup> The poll found 96% of Americans say animals deserve at least some protection from harm and exploitation, and “women are twice as

likely as men to say they want the same rights for animals as people”.<sup>7</sup> According to the poll, 69% percent of women favored stricter laws for farm animals as opposed to 55% of men.<sup>7</sup> Consumers were less concerned about the welfare of animals employed in testing products such as cosmetics than they were about the welfare of farm animals.<sup>7</sup> Johnson attributes the desire for stricter laws relating to farm animals to an uninformed public that is removed from agriculture by generations.<sup>11</sup>

A survey of veterinary students from two universities in the UK indicated students tended to show less empathy to dogs, cats, and cows as they progressed through their veterinary curriculum, but this appeared to be related to gender, as female students rated themselves as having higher levels of emotional empathy. This empathy persisted throughout their veterinary education, while male students’ empathy diminished as education progressed.<sup>16</sup>

A survey of animal science students in Michigan revealed students had more empathy for horses experiencing pain, boredom, or kept in “industry-typical” scenarios than they did for other species.<sup>10</sup> Furthermore, a majority of these students indicated they would not be comfortable buying/consuming dairy products from dairy, egg, or pig production facilities that used industry-typical practices.<sup>10</sup> The authors concluded that their data supported the concept that, “even amongst a population that should be knowledgeable about animal agriculture, awareness of modern animal agriculture practices is low, and does not necessarily represent that concern is absent”.<sup>10</sup> Identifying and addressing animal welfare issues within production agriculture presents opportunities to demonstrate agriculture’s continuing commitment to animals under our care, and to design curricula to address misperceptions.

There is increasing demand for veterinarians to provide animal welfare expertise, and for veterinary students to have increased educational opportunities in animal welfare.<sup>4,15</sup> To enable university students pursuing careers in animal science and veterinary medicine to deal with welfare-related issues, formal curricula in animal welfare is necessary.<sup>3,4,15,19</sup> Prior to 1986, few animal welfare courses were offered globally. Today, there are substantially more courses; however, there is a continued need to provide diverse curricula to aspiring veterinarians and animal scientists.<sup>3,4,12,15,18,19</sup>

Today’s students in animal agriculture will be tomorrow’s livestock stakeholders.<sup>10</sup> To determine animal welfare perceptions and attitudes of future agricultural professionals, data were collected from students representing the College of Agriculture and Life Sciences and the College of Veterinary Medicine at Texas A&M University. The authors also wanted to determine students’ practical understanding of Beef Quality Assurance (BQA), so appropriate questions were added

to the survey. These data will be used to guide future undergraduate animal science curricula, to correct student misperceptions, and increase understanding of animal welfare practices in production agriculture and principles of beef quality assurance.

This paper is part of a larger study to assess the attitudes, perceptions and knowledge of animal welfare and BQA principles of students involved in production agriculture, livestock producers, and livestock market employees. Texas AgriLife Extension Service, a part of the Texas A&M System, conducted this survey.

### Materials and Methods

A cross-sectional pre-test survey design was utilized to gather animal welfare perceptions from a convenience sample of university students in the College of Agriculture and Life Sciences and the College of Veterinary Medicine at Texas A&M University. Data were collected from 201 animal science graduate and undergraduate students or veterinary medicine students. Data were analyzed using the Statistical Package for the Social Sciences (SPSS). The survey protocol was exempted from Institutional Review Board review by the Texas A&M University Office of Research Compliance.

The pre-test contained Likert-type scale questions and open-ended responses. The Likert scales measured students' agreement levels (1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree) with 33 statements pertaining to animal welfare comprising five constructs: Production Agriculture; Production Methods; Attitude toward Animals in General; Attitude toward Animals in Production Agriculture; and Production Practices. Statements comprising the constructs are listed in Tables 2 through 6. Content and face validity of the survey instrument were established by a review panel consisting of university faculty, graduate students, and industry experts in animal welfare, animal science, and veterinary medicine.

Student scores about individual animal welfare statements for each construct were summed. A perception is an attitude comprised of more than one variable of interest to determine an overall perception for each construct. Cronbach's alpha coefficient was used to determine summed scale reliabilities for students' animal welfare perceptions at the beginning of the workshop.<sup>5</sup> Observational reliabilities should be at 0.75 or above and 0.50 or above for attitude tests.<sup>5</sup> "If the measurement results are to be used for making a decision about a group or even for research purposes, a lower reliability coefficient (in the range of 0.50 to 0.60) is often acceptable".<sup>20</sup> Based on the above criteria, Production Practices, Production Agriculture, and Production Methods, as used in the survey, met the acceptability level of 0.75. Animals in Production Agriculture and Attitudes Towards Ani-

mals in General had a coefficient above 0.50, so were included in the analyses because they were measures of attitude (Table 1).

Students from the College of Agriculture and Life Science and the College of Veterinary Medicine were invited to attend an evening workshop conducted at Texas A&M University. Student workshop attendance and participation in the animal welfare survey were voluntary and responses were anonymous. The workshop was three hours in duration and presentations focused on the importance of low-stress cattle handling, BQA, and food safety through residue avoidance. The survey was administered before the start of the workshop.

To gather baseline data of student animal welfare perceptions and BQA knowledge, descriptive statistics were used to describe university students' perceptions of animal welfare at the beginning of the workshop. Independent Samples t-test analyses were conducted to determine if statistically significant ( $P < 0.05$ ) differences existed in student responses due to gender and background for the 33 individual animal welfare statements; the five constructs of animal welfare perception; and overall animal welfare attitude.

### Results and Discussion

Participant demographics (Table 2) included undergraduate, graduate, and professional students from the College of Agriculture and Life Sciences and the College of Veterinary Medicine at Texas A&M University. Sixty-one percent of the participants were female. Undergraduate students comprised 83% of the respondents. Graduate and professional students from the College of Agriculture and Life Sciences and the College of Veterinary Medicine accounted for the remaining 17%. Almost 62% of the students reported a rural background, although a student could have claimed a rural background and not have been involved in agriculture.

Eighty percent of the participants were White/Caucasian, 10% were Hispanic American, 2% were Asian American, and 2% were Native American. Fifty-seven percent of participants were between the ages of 20 and 24 years of age and 32% were less than 20 years

**Table 1.** Reliability coefficients for student animal welfare constructs.

Scale	Statements	$\alpha$
Production agriculture	6	.85
Production methods	6	.78
Attitudes toward animals in general	5	.52
Animals in production agriculture	7	.59
Production practices	9	.90

of age. Forty-two percent of students were members of an agricultural group, 4% were members of an environmental group, 2% were members of an animal welfare organization, and one participant was a member of an animal rights group (Table 2).

Details of students' perceptions of production agriculture are in Table 3. Overall, students indicated a favorable perception of production agriculture's attitudes concerning animal welfare. Students strongly agreed that production agriculture is knowledgeable of animals'

physical needs and uses humane practices. Students agreed that production agriculture promotes an accurate description of animal treatment, is knowledgeable of animals' psychological needs, and responds to constructive criticism. The lowest level of agreement among students was their perception of production agriculture's willingness to change. The survey data were analyzed to determine if response to questions concerning production agriculture was influenced by gender. Male and female students responded similarly to all of the

**Table 2.** Demographics of students participating in the survey.

Category	Subcategory	Number of students	%
Age	20 – 24	114	56.7
	Less than 20 years	65	32.3
	25 – 29	12	6.0
	30 – 34	2	1.0
	40 or more years	2	1.0
Gender	Female	122	60.7
	Male	69	34.3
Background	Rural	122	60.7
	Urban	68	33.8
Education level	Undergraduate student	166	82.6
	Graduate student	13	6.5
	Professional student	10	5.0
Race/ethnicity	White/Caucasian	161	80.1
	Hispanic American	19	9.5
	Asian American	4	2.0
	Native American	4	2.0
	Multi-racial	1	0.5
	Other	1	0.5
Member	None	96	47.8
	Agricultural groups	85	42.3
	Environmental groups	8	4.0
	Animal welfare groups	4	2.0
	Animal rights groups	1	0.5

**Table 3.** Students' mean level of agreement for statements comprising production agriculture.

Item	Overall <sup>a</sup>	Gender		
		Male	P-value	Female
Knowledgeable of animal's physical needs	3.67	3.80	0.88	3.82
Uses humane practices	3.54	3.58	0.73	3.62
Knowledgeable of animals' psychological needs	3.45	3.73	0.58	3.85
Promotes an accurate description of animal treatment	3.43	3.53	0.27	3.74
Responds to constructive criticism	3.36	3.39	0.04	3.80
Responds to proposed change	3.20	3.34	0.18	3.64
Students' overall perception of production agriculture	3.45	3.45	0.92	3.45

<sup>a</sup>Values: 1.00 – 1.50 = strongly disagree; 1.51 – 2.50 = disagree; 2.51 – 3.50 = agree; 3.51 – 4.00 = strongly agree.

perceptions of production agriculture questions except for the statement that production agriculture responds to constructive criticism. Male students agreed with the statement and female students strongly agreed. Students from rural and urban backgrounds responded similarly to the questions about production agriculture.

Overall, students indicated a favorable perception of production methods. Students strongly agreed that production methods should guarantee the physical well-being of animals as well as their mental well-being (Table 4). There was agreement that production methods should guarantee that the quality of life of animals maintained in confinement is acceptable and raising animals in confinement improves food safety. There was disagreement with the statement that treatment of animals in confinement situations does not allow the

animals an acceptable quality of life; however, there was more variation in student responses to this question. It is the opinion of the authors that the term “quality of life” is a more subjective statement and is open for broader interpretation. No difference was indicated in students’ perceptions of production methods due to either gender or background.

Overall, students indicated a favorable attitude toward animals in general (Table 5). The statement, “I am interested in and have a strong affection for individual animals, especially pets.” received the highest agreement score by students. They indicated interest in the commercial value of animals to benefit humans and how animals are treated, and they opposed exploitation or cruelty towards animals. Their attitude toward the use of animals in sporting events/situations received the

**Table 4.** Students’ mean level of agreement for statements comprising production methods.

Item	Overall <sup>a</sup>
Should guarantee the physical well-being of the animal	3.63
Should guarantee the mental well-being of the animal	3.48
Should guarantee both the physical and mental well-being of the animal	3.53
The quality of life of all animals maintained in confinement is acceptable	3.35
Raising animals in confinement improves human food safety	3.35
Treatment of animals by people in confinement situations does not allow the animals an acceptable quality of life	2.38

<sup>a</sup>Values: 1.00 – 1.50 = strongly disagree; 1.51 – 2.50 = disagree; 2.51 – 3.50 = agree; 3.51 – 4.00 = strongly agree.

**Table 5.** Students’ mean level of agreement for statements evaluating their attitude toward animals in general.

Item	Overall <sup>a</sup>	Gender			Background		
		Male	P-value	Female	Rural	P-value	Urban
Interested in and have a strong affection for individual animals, especially pets	3.49	3.28	0.001	3.60	3.93	0.001	3.69
Interested in the commercial value of animals to benefit humans	3.40	3.50	0.35	3.68	3.63	0.36	3.47
Interested in how animals are treated and am opposed to exploitation or cruelty towards animals	3.35	3.42	.089	3.40	3.34	0.05	3.59
Interested in the use of animals in sporting events/situations	3.21	3.47	0.92	3.50	3.58	0.16	3.28
Rarely think about animals and favor avoiding contact with them if possible	1.53	1.53	0.80	1.50	1.50	0.62	1.57

<sup>a</sup>Values: 1.00 – 1.50 = strongly disagree; 1.51 – 2.50 = disagree; 2.51 – 3.50 = agree; 3.51 – 4.00 = strongly agree.

lowest agreement score. The students disagreed with the statement “they rarely think about animals and avoid contact if possible.” Females were more interested in and had a stronger affection for individual animals, especially pets. This is consistent with prior research that found female veterinary students reported higher levels of emotional empathy towards animals than their male counterparts and male students tended to show less empathy to animals as they progressed through the educational process.<sup>6</sup> Urban students rated the same question higher, indicating they had more emotional empathy than rural students.

Overall, students indicated a favorable attitude toward animals in production agriculture (Table 6). Students indicated the highest agreement with the statement that interests of both humans and animals should be considered in settling production animal treatment issues, followed by the statement that animals should be managed best to suit human interests. Students agreed that animals deserve the kind of life that satisfies their natural instincts; and, like humans, animals deserve to live a happy life. Student responses indicated they are not just concerned with the benefits animals bring to humans, but are also concerned with the animals’ treatment. The statement that animals in production agriculture are gentle creatures and deserve affection showed the lowest agreement. Respondents believe that animals in production agriculture should be treated in a manner that satisfies their natural instincts and they deserve to live a happy life, but do not necessarily require affection. It was apparent the students believed that humans should be responsible for the welfare of production animals because they disagreed that people

have more important concerns than worrying about how production animals are treated and that animals are of no concern except to provide products for humans. Male and female students, as well as students from rural and urban backgrounds, responded similarly to the production agriculture questions.

The final portion of the survey gathered students’ level of agreement with statements concerning animal agriculture production practices. Overall, students indicated a favorable perception of animal agriculture production practices. The group strongly agreed castration of farm animals and using squeeze chutes to restrain cattle were acceptable practices (Table 7). There was positive agreement about the practices of clipping teeth in day-old pigs, hot iron branding, maintaining sows in farrowing crates, beak trimming of poultry, maintaining laying hens in battery cages, and separating newborn dairy calves from their mothers.

To determine students’ knowledge about the principles of BQA, students were asked to indicate the correct location and volume per injection of 30 ml of antibiotic. Only 44% of students correctly identified the proper injection site and even fewer, 24%, were able to determine the proper amount of antibiotic that should be injected per site. These low numbers indicate that many students anticipating careers in production agriculture are not familiar with principles of BQA.

The students surveyed either had some on-farm experiences or were likely exposed to production practices through university courses, and thus, generally accepted animal agriculture production practices. Students also could have gained exposure to animal agriculture through 4-H or FFA activities, but this

**Table 6.** Students’ mean level of agreement regarding their attitude toward animals in production agriculture.

Item	Overall <sup>a</sup>	Gender		
		Male	P-value	Female
Interests of both humans and animals should be considered in settling production animal issues	3.41	3.61	0.99	3.61
Are managed best to suit human interests	3.10	3.39	0.93	3.41
Deserve the kind of life that satisfied their natural instincts	3.10	3.35	0.26	3.63
Like humans, deserve to live a happy life	3.07	3.24	0.50	3.38
Are gentle creatures which deserve affection	2.71	2.88	0.14	3.25
People have more important concerns other than worrying about how production animals are treated	2.21	2.59	0.67	2.48
Are of no concern to me, except to provide products for humans	1.82	2.20	0.08	1.84
Overall attitude toward animals in production agriculture	3.05	2.96	0.01	3.11

<sup>a</sup>Values: 1.00 – 1.50 = strongly disagree; 1.51 – 2.50 = disagree; 2.51 – 3.50 = agree; 3.51 – 4.00 = strongly agree.

**Table 7.** Students' mean level of agreement regarding animal agriculture production practices.

Item	Overall <sup>a</sup>	Background		
		Rural	P-value	Urban
Castrating male farm animals is an acceptable practice	3.58	3.56	0.04	3.79
Using squeeze chutes to restrain cattle is an acceptable practice	3.58	3.63	0.68	3.59
Clipping teeth of day-old piglets is an acceptable practice	3.45	3.71	0.73	3.78
Hot iron branding is an acceptable practice	3.39	3.56	0.71	3.50
Maintaining sows in farrowing crates is an acceptable practice	3.39	3.50	0.31	3.68
Beak trimming of poultry is an acceptable practice	3.27	3.83	0.50	4.03
Maintaining laying hens in battery cages is an acceptable practice	3.24	3.86	0.25	4.22
Separating newborn dairy calves from their mothers is an acceptable practice	3.15	3.26	0.87	3.29
Slaughtering livestock without stunning them with a captive bolt is an acceptable practice	2.56	3.50	0.04	2.79

<sup>a</sup>Values: 1.00 – 1.50 = strongly disagree; 1.51 – 2.50 = disagree; 2.51 – 3.50 = agree; 3.51 – 4.00 = strongly agree.

does not necessarily equate to exposure to production agriculture. Students familiar with one phase of beef cattle production may not understand how the system relates to other phases.

As a result of this survey, faculty in the Colleges of Agriculture and Life Sciences and Veterinary Medicine at Texas A&M University have agreed to incorporate student BQA instruction leading to a student BQA Certification into the existing curricula. Furthermore, the College of Veterinary Medicine and Department of Animal Science at Texas A&M University, the Department of Animal Science at Sam Houston State University, and the Texas AgriLife Extension Service have collaborated to provide standardized instruction in BQA and low-stress cattle handling. Texas and Southwestern Cattle Raisers, Texas Beef Council, and Texas AgriLife Extension Service administers the BQA program in Texas and provides student certification to all who complete the standardized program. In the summer and fall sessions, approximately 850 students in the Animal Science Department at Texas A & M University attended a basic BQA program and were awarded certificates of completion. In response to the certification program, students requested more information about how the cattle industry was dealing with animal welfare issues.

A three-hour program sponsored by the Saddle and Sirloin Club and the Student Chapter of the American Association of Bovine Practitioners was presented by Animal Science/AgriLife Extension faculty to address those concerns. Students observed a live demonstration about low-stress cattle handling techniques and took virtual tours of a feedlot and a livestock harvest facility. Students were able to see firsthand how animal welfare issues were addressed in different phases of the beef production system. This program was well received by

university faculty and students as being very informative and practical.

Understanding student beliefs about production practices associated with animal production, and their relationship to animal welfare, will enable instructors to tailor curricula to fill knowledge gaps previously unrecognized.

## Conclusions

Students engaged in this study are the livestock industry stakeholders of the future. Students' overall perceptions indicated they believed production agriculture was doing a good job related to animal welfare. Their attitudes concerning production agriculture indicated no disagreement with current practices, and indicated that students are concerned about the treatment of animals and their welfare. Students' knowledge of BQA principles were lacking. As a result of this survey, BQA has been introduced into animal science curriculum, and programs highlighting animal welfare are becoming more common.

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# Baytril® 100

(enrofloxacin)



## 100 mg/mL Antimicrobial Injectable Solution

For Subcutaneous Use in Beef Cattle, Non-Lactating Dairy Cattle and Swine Only  
Not For Use In Female Dairy Cattle 20 Months of Age or Older  
Or In Calves To Be Processed For Veal

### BRIEF SUMMARY:

Before using Baytril® 100, please consult the product insert, a summary of which follows:

### CAUTION:

Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian.  
Federal (U.S.A.) law prohibits the extra-label use of this drug in food-producing animals.

### PRODUCT DESCRIPTION:

Each mL of Baytril® 100 contains 100 mg of enrofloxacin. Excipients are L-arginine base 200 mg, n-butyl alcohol 30 mg, benzyl alcohol (as a preservative) 20 mg and water for injection q.s.

### INDICATIONS:

**Cattle:** Baytril® 100 is indicated for the treatment of bovine respiratory disease (BRD) associated with *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni* (previously *Haemophilus somnus*) in beef and non-lactating dairy cattle.

**Swine:** Baytril® 100 is indicated for the treatment and control of swine respiratory disease (SRD) associated with *Actinobacillus pleuropneumoniae*, *Pasteurella multocida*, *Haemophilus parasuis* and *Streptococcus suis*.

### RESIDUE WARNINGS:

**Cattle:** Animals intended for human consumption must not be slaughtered within 28 days from the last treatment. Do not use in female dairy cattle 20 months of age or older. Use of enrofloxacin in this class of cattle may cause milk residues. A withdrawal period has not been established for this product in pre-ruminating calves. Do not use in calves to be processed for veal.

**Swine:** Animals intended for human consumption must not be slaughtered within 5 days of receiving a single-injection dose.

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**For use in animals only. Keep out of the reach of children.** Avoid contact with eyes. In case of contact, immediately flush eyes with copious amounts of water for 15 minutes. In case of dermal contact, wash skin with soap and water. Consult a physician if irritation persists following ocular or dermal exposures. Individuals with a history of hypersensitivity to quinolones should avoid this product. In humans, there is a risk of user photosensitization within a few hours after excessive exposure to quinolones. If excessive accidental exposure occurs, avoid direct sunlight. For customer service or to obtain product information, including a Material Safety Data Sheet, call 1-800-633-3796. For medical emergencies or to report adverse reactions, call 1-800-422-9874.

### PRECAUTIONS:

The effects of enrofloxacin on cattle or swine reproductive performance, pregnancy and lactation have not been adequately determined. The long-term effects on articular joint cartilage have not been determined in pigs above market weight. Subcutaneous injection can cause a transient local tissue reaction that may result in trim loss of edible tissue at slaughter. Baytril® 100 contains different excipients than other Baytril® products. The safety and efficacy of this formulation in species other than cattle and swine have not been determined. Quinolone-class drugs should be used with caution in animals with known or suspected Central Nervous System (CNS) disorders. In such animals, quinolones have, in rare instances, been associated with CNS stimulation which may lead to convulsive seizures. Quinolone-class drugs have been shown to produce erosions of cartilage of weight-bearing joints and other signs of arthropathy in immature animals of various species. See Animal Safety section for additional information.

### ADVERSE REACTIONS:

No adverse reactions were observed during clinical trials.

### ANIMAL SAFETY:

**Cattle:** Safety studies were conducted in feeder calves using single doses of 5, 15 and 25 mg/kg for 15 consecutive days and 50 mg/kg for 5 consecutive days. No clinical signs of toxicity were observed when a dose of 5 mg/kg was administered for 15 days. Clinical signs of depression, incoordination and muscle fasciculation were observed in calves when doses of 15 or 25 mg/kg were administered for 10 to 15 days. Clinical signs of depression, inappetence and incoordination were observed when a dose of 50 mg/kg was administered for 3 days. No drug-related abnormalities in clinical pathology parameters were identified. No articular cartilage lesions were observed after examination of stifle joints from animals administered 25 mg/kg for 15 days.

A safety study was conducted in 23-day-old calves using doses of 5, 15 and 25 mg/kg for 15 consecutive days. No clinical signs of toxicity or changes in clinical pathology parameters were observed. No articular cartilage lesions were observed in the stifle joints at any dose level at 2 days and 9 days following 15 days of drug administration.

An injection site study conducted in feeder calves demonstrated that the formulation may induce a transient reaction in the subcutaneous tissue and underlying muscle. No painful responses to administration were observed.

**Swine:** A safety study was conducted in 32 pigs weighing approximately 57 kg (125 lb) using single doses of 5, 15, or 25 mg/kg daily for 15 consecutive days. Incidental lameness of short duration was observed in all groups, including the saline-treated controls. Musculoskeletal stiffness was observed following the 15 and 25 mg/kg treatments with clinical signs appearing during the second week of treatment. Clinical signs of lameness improved after treatment ceased and most animals were clinically normal at necropsy.

A second study was conducted in two pigs weighing approximately 23 kg (50 lb), treated with 50 mg/kg for 5 consecutive days. There were no clinical signs of toxicity or pathological changes.

An injection site study conducted in pigs demonstrated that the formulation may induce a transient reaction in the subcutaneous tissue. No painful responses to administration were observed.

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For medical emergencies or to report adverse reactions, call 1-800-422-9874.

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Federal law restricts this drug to use by or on the order of a licensed veterinarian. Extra-label use in food-producing animals is prohibited. Cattle intended for human consumption must not be slaughtered within 28 days from the last treatment.

Injectable **Baytril® 100**  
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