



**ANIMAL SCIENCE
ANIMAL PRODUCTION
ASSISTANT
SKILLS STANDARDS
OD46101**

Competency-Based Education: OKLAHOMA'S RECIPE FOR SUCCESS

BY THE INDUSTRY FOR THE INDUSTRY

Oklahoma's *CareerTech* system of competency-based education uses industry professionals and certification standards to identify the knowledge and abilities needed to master an occupation. This industry input provides the foundation for development of instructional materials that help prepare the comprehensively trained, highly skilled employees demanded by our workplace partners.

TOOLS FOR SUCCESS

CareerTech relies on three basic instructional components to deliver competency-based instruction: skills standards, curriculum materials, and competency assessments.

Skills standards provide the foundation for competency-based instruction in Oklahoma's *CareerTech* system. The skills standards outline the knowledge, skills, and abilities needed to perform related jobs within an industry. Skills standards are aligned with national skills standards; therefore, a student trained to the skills standards possesses technical skills that make him/her employable in both state and national job markets.

Curriculum materials contain information and activities that teach students the knowledge and skills outlined in the skills standards. In addition to complementing classroom instruction, curriculum resources provide supplemental activities to enhance learning and provide hands-on training experiences.

Competency Assessments test the student over material outlined in the skills standards and taught using the curriculum materials. When used with classroom performance evaluations, written competency assessments provide a means of measuring occupational readiness.

Although each of these components satisfy a unique purpose in competency-based education, they work together to reinforce the skills and abilities students need to gain employment and succeed on the job.

MEASURING SUCCESS

Written competency assessments are used to evaluate student performance. Results reports communicate competency assessment scores to students and provide a breakdown of assessment results by duty area. The results breakdown shows how well the student has mastered skills needed to perform major job functions and identifies areas of job responsibility that may require additional instruction and/or training.

Group analysis of student results also provides feedback to instructors seeking to improve the effectiveness of career and technology training. Performance patterns in individual duties indicate opportunities to evaluate training methods and customize instruction.

TRUE TO OUR PURPOSE

"Helping Oklahomans succeed in the workplace" defines the mission of Oklahoma *CareerTech* and its competency-based system of instruction. Skills standards, curriculum, and assessments that identify and reinforce industry expectations provide accountability for programs and assure *CareerTech*'s continued role in preparing skilled workers for a global job market

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**ANIMAL SCIENCE
ANIMAL PRODUCTION ASSISTANT
SKILLS STANDARDS
Frequency and Criticality Ratings**

- Duty A: Demonstrate Knowledge of Safety Issues
- Duty B: Demonstrate Knowledge in the Selection and Breeding of Livestock
- Duty C: Demonstrate Knowledge of Reproductive Organs
- Duty D: Demonstrate Knowledge of Artificial Insemination (AI)
- Duty E: Demonstrate Knowledge of Fertility and Pregnancy Testing
- Duty F: Demonstrate Knowledge of Birth Assistance
- Duty G: Demonstrate Knowledge of Animal Science Health Care
- Duty H: Demonstrate Knowledge of Livestock Diseases and Parasites
- Duty I: Demonstrate Knowledge of Nutrition, Feeds, and Additives
- Duty J: Demonstrate Knowledge of Vaccinations and Drugs
- Duty K: Demonstrate Knowledge of Dehorning, Docking, and Castration
- Duty L: Demonstrate Knowledge of Hoof Trimming, Shearing, and Animal Identification
- Duty M: Demonstrate Knowledge of Marketing Livestock and Market Agencies
- Duty N: Demonstrate Knowledge of Market Grades and Classes of Livestock

Frequency: represents how often the task is performed on the job. Frequency rating scales vary for different occupations. The rating scale used in this publication is presented below:

- 1 = less than once a week
- 2 = at least once a week
- 3 = once or more a day

Criticality: denotes the level of consequence associated with performing a task incorrectly. The rating scale used in this publication is presented below:

- 1 = slight
- 2 = moderate
- 3 = extreme

DUTY A: Demonstrate Knowledge of Safety Issues

CODE	TASK	F/C
A.01	Demonstrate knowledge of safety in the animal science industry	3/3
A.02	Demonstrate Knowledge of current events in animal science safety	1/3
A.03	State safety factors to observe in working and handling livestock <ul style="list-style-type: none"> • Observe livestock facilities for potential hazards • Wear protective clothing • Use man gates in pens • Avoid handling in small areas 	3/3

	<ul style="list-style-type: none"> • Use catwalks along chutes • Maintain adequate lighting • Remove horns • Use proper restraints • Approach from front • Avoid entering the “flight zone” • Avoid sudden loud noises • Use proper disinfectant procedures • Respect maternal instincts • Allow cattle to follow herd leaders • Don't trust breeding males of livestock • Working knowledge of behavioral factors 	
A.04	<p>Demonstrate knowledge of factors affecting facility safety and precautions for equipment</p> <ul style="list-style-type: none"> • Operate after proper training • Wear protective clothing • Use the appropriate equipment for the job • Operate and maintain equipment according to instruction manual • Use shields and guards • Inspect equipment regularly • Replace defective and worn parts • Shut off power before adjustment • Keep others away from the equipment • Equipped tractors with roll-over protection equipment • Remove keys • Use sturdy hitches • Open doors before starting equipment • Place warning signs on equipment • Keep storage area clean • Maintain a complete first aid kit • Keep appropriate fire safety equipment 	3/3
A.05	Demonstrate knowledge of common livestock handler injuries and their causes	3/3
A.06	<p>Demonstrate knowledge of the hazards of animal diseases</p> <ul style="list-style-type: none"> • Zoonoses 	2/3

DUTY B: Demonstrate Knowledge in the Selection and Breeding of Livestock

CODE	TASK	F/C
B.01	Demonstrate knowledge of factors in selecting livestock for desirable characteristics	1/2
B.02	<p>Demonstrate knowledge of inherited traits and heritability</p> <ul style="list-style-type: none"> • Genotype • Phenotype 	1/1
B.03	Demonstrate knowledge of sex determination and sex-linked traits	1/1

B.04	Determine color inheritance of offspring	1/1
B.05	Estimate possible gene combinations using the Punnett Square method	1/1
B.06	Demonstrate knowledge of abnormal genetic conditions	1/1
B.07	Demonstrate knowledge of factors affecting fertility <ul style="list-style-type: none"> • Low quality semen • Physical defects and injuries • Psychological condition • Infection and disease • Poor management and feeding • Inherited abnormalities • Age • High temperature • Cystic ovary disease caused by hormonal imbalance • Silent heat: a female that shows no sign of estrus • Freemartin 	3/3
B.08	Analyze expected progeny difference (EPD) records and performance records	1/2
B.09	Calculate percentage calf/lamb crop	3/3
B.10	Demonstrate knowledge of mating systems and methods and their descriptions, advantages, and disadvantages	3/3
B.11	Define breeding periods <ul style="list-style-type: none"> • Puberty • Estrous cycle • Ovulation • Fertilization • Gestation • Parturition 	3/3
B.12	Demonstrate knowledge of estrous cycle, heat synchronization, breeding times, and gestation periods	3/3

DUTY C: Demonstrate Knowledge of Reproductive Organs

CODE	TASK	F/C
C.01	Demonstrate knowledge of male reproductive organs and their functions <ul style="list-style-type: none"> • Prostate • Cowpers glands • Retractor penis muscle • Penis • Spermatic cord • Head of epididymis • Scrotum • Testicles • Sheath • Bladder • Ampulla • Vesicular gland 	1/1
C.02	Demonstrate knowledge of the components and functions of the reproductive organs and tracts of a cow and a sow <ul style="list-style-type: none"> • Left horn of uterus • Right horn of uterus • Ovary • Cervix • Vagina 	1/2

	<ul style="list-style-type: none"> • Vulva • Clitoris • Uterus • Fimbria • Ovary • Fallopian tube • Urinary bladder • Anus • Broad ligament 	
C.03	Demonstrate knowledge of hormones and their functions <ul style="list-style-type: none"> • Testosterone • Estrogen • Progesterone 	1/2

DUTY D: Demonstrate Knowledge of Artificial Insemination (AI)

CODE	TASK	F/C
D.01	Know how AI equipment is used <ul style="list-style-type: none"> • Nitrogen chest/tank • Thaw box • Inseminating gun • Polybulb • Straw clippers • Straw • Ampule • Inseminating tube • Speculum • Inseminating rods (spirettes) • Swine semen storage unit • Thermometer 	3/3
D.02	Know factors that contribute to poor conception rates <ul style="list-style-type: none"> • Improper timing • Diseases • Poor insemination technique • Management failure • Ovulation failure 	3/3
D.03	Identify methods of thawing semen in straws and ampules	3/3
D.04	Demonstrate ability to examine semen for viability and abnormalities <ul style="list-style-type: none"> • Characteristics and components of semen 	1/2
D.05	Know the percentage of pregnancies expected to the number of services when using AI in cattle and swine <ul style="list-style-type: none"> • Conception rate increases 	1/2
D.06	Demonstrate knowledge of the reasons livestock do not settle <ul style="list-style-type: none"> • Disease • Physical defects • Ovulation failure • Delayed ovulation • Defective sperm • The failure of the follicle to rupture and release the egg • Nutritional deficiencies interrupting the estrous cycle 	1/1
D.07	Know standard practices for using AI <ul style="list-style-type: none"> • Check with breed associations regarding the use of AI for registration • Check animals twice a day to detect females in heat 	3/3

	<ul style="list-style-type: none"> • Provide good handling facilities • Handle the animals gently • Use a qualified technician to inseminate animals • Use a good identification system and keep accurate records of the breeding date and the birthing date • Importance of estrous cycle 	
D.08	<p>Know errors in placing the insemination tube in a cow</p> <ul style="list-style-type: none"> • Placing the tube in the blind cavity of the cervix • Placing the tube in the urethra • Placing the tube in the fold of the vaginal wall • Pushing the tube too far into the uterus so the sperm is deposited in one uterine horn • Letting the tube slip back into the cervix 	1/1

DUTY E: Demonstrating Knowledge of Fertility and Pregnancy Testing

CODE	TASK	F/C
E.01	<p>Know methods of pregnancy testing</p> <ul style="list-style-type: none"> • Rectal palpation • After 42 days from breeding • Progesterone • Ultrasonic scanning • Rectal Doppler technique • Rectal-abdominal palpation 	3/3
E.02	Develop a chart showing pregnancy testing methods of different species	3/3
E.03	Know indications of pregnancy in a rectal examination	3/3
E.04	Demonstrate knowledge of the stages of pregnancy	3/3
E.05	<p>Demonstrate knowledge of fertility testing in males</p> <ul style="list-style-type: none"> • Quality of semen • Physical defects and injuries • Psychological condition • Infection and disease • Management and feeding • Inherited abnormalities 	3/3

DUTY F: Demonstrate Knowledge of Birth Assistance

CODE	TASK	F/C
F.01	Know the stages of parturition, their characteristics, dams, and types of assistance	3/3
F.02	<p>Demonstrate knowledge of dystocia</p> <ul style="list-style-type: none"> • Cow in calving • Ewe in lambing • Farrow a sow 	3/3
F.03	<p>Identify chemicals and drugs needed to assist with the birthing process</p> <ul style="list-style-type: none"> • Obstetrical soap • Lubricant • Broad-range antibiotic • Antiseptic • Disinfectant • Oxytocin 	3/3

	<ul style="list-style-type: none"> • Injection supplies 	
F.04	Identify basic instruments needed to assist with calving difficulties <ul style="list-style-type: none"> • Obstetrical chain or soft rope • Obstetrical handles • Mechanical calf puller 	3/3
F.05	Know how to perform a vaginal examination by hand <ul style="list-style-type: none"> • Wear a glove or sleeve to prevent the transmission of zoonoses • Use a proper antiseptic • Check the cervical dilation • Check for signs of life • Check presentation, position, and posture • Check for size • Calving and lambing positions 	3/3
F.06	Demonstrate knowledge of care for the newborn calf, lamb, and piglet	3/3
F.07	Demonstrate ability to clip newborn piglets needle teeth, dock tails, and notch ears <ul style="list-style-type: none"> • Litter number • Pig number • Proper size equipment 	3/3

DUTY G: Demonstrate Knowledge of Animal Science Health Care

CODE	TASK	F/C
G.01	Identify factors affecting animal health <ul style="list-style-type: none"> • Heredity • Nutrition • Parasites • Injuries • Environmental stress • Human behavior, human decisions, and human error • Protection from the elements • Fresh water • Sufficient and suitable feed • Treat animal with respect 	3/3
G.02	Identify signs of a healthy animal <ul style="list-style-type: none"> • Contentment • Alertness • Aggressive appetite • Sleek hair and smooth, pliable skin • Bright eyes • Normal feces and urine • Normal temperature, pulse rate, and breathing rate • Alert, normal ear set 	3/3
G.03	Identify signs of an unhealthy animal <ul style="list-style-type: none"> • Decreased food or water consumption; failure of young animals to nurse • Listlessness • Dry nose • Abnormal feces or urine, or difficulty in elimination • Abnormal discharge from the nose, mouth, or eyes • Unusual posture • Persistent rubbing or licking • Dull hair and dry, scruffy skin 	3/3

	<ul style="list-style-type: none"> • Inflammation or swelling under or on the skin • Loss of hair or feathers • Pale, red, or purple mucous membranes lining the eyes or gums • Unusual movements or reluctance to move • Abnormal temperature, breathing, or pulse rate • Altered social behavior • Sudden drop in production • Ruminants not chewing their cud 	
G.04	Demonstrate ability to take an animal's temperature	1/3
G.05	Identify good management practices for maintaining animal health <ul style="list-style-type: none"> • Purchase animals from reputable producers • Ask the producer for appropriate health papers and ask questions that might uncover health problems • Isolate newly purchased animals in a separate pasture, lot, or barn • Control outside traffic, including vehicles and people • Maintain a comprehensive sanitation program • Dispose of dead animals promptly and properly • Maintain adequate fencing 	2/2
G.06	Identify factors to consider when developing a health plan <ul style="list-style-type: none"> • Keep complete records • Closed herd • Preventative medicine • Male reproductive soundness • Institute and maintain a comprehensive sanitation program 	3/3
G.07	Demonstrate knowledge of disinfectants, their uses, and descriptions	1/1
G.08	Demonstrate ability to collect fresh urine and fecal samples	2/2
G.09	Demonstrate knowledge of considerations and ability to treat wounds	3/3
G.10	Select major shelter requirements of livestock <ul style="list-style-type: none"> • Provide good ventilation • Maintain acceptable temperatures • Provide an appropriate environment for newborn animals 	1/1
G.11	Identify restraints for cattle, sheep, swine, and poultry <ul style="list-style-type: none"> • Cattle stock • Cattle chute and headgate • Tilting calf table • Rope squeeze casting • Castration restraint • Calf castration tie • Flank casting • Rope • Trimming stand • Panels • Chute • Chin catch restraint • Castration and docking restraint for small sheep • Shearing stance • Halter • Flank catch • Hog holder/nose snare • Snubbing rope • Head gate • Vaccination or castration restraint for small pigs • Vaccination or castration restraint for large pigs 	3/3

	<ul style="list-style-type: none"> • Heart girth 	
G.12	Demonstrate ability to use flank casting and castration restraint on cattle	1/1
G.13	Demonstrate ability to use vaccination or castration restraint on small pigs	1/1
G.14	Demonstrate ability to use castration and docking restraint on small sheep	1/1

DUTY H: Demonstrate Knowledge of Livestock Diseases and Parasites

CODE	TASK	F/C
H.01	Know the life cycle stages of internal parasites	1/1
H.02	Know the life cycle stages of external parasites	1/1
H.03	Demonstrate knowledge of parasite	3/3
H.04	Demonstrate knowledge of disease prevention	3/3
H.05	Demonstrate knowledge of infectious diseases	3/3
H.06	Demonstrate knowledge of noninfectious diseases	3/3

DUTY I: Demonstrate Knowledge of Nutrition, Feeds, and Additives

CODE	TASK	F/C
I.01	Know the digestive process of ruminants, nonruminants, and poultry	2/2
I.02	Identify the categories of food <ul style="list-style-type: none"> • High in cellulose or fiber and relatively high in digestible nutrients • Feeds that are low in fiber and relatively high in digestible nutrients • "Extras" like salt or mineral block that supply specific nutrients • compounds added to feed to preserve it or to alter animal metabolism 	3/3
I.03	Identify the uses of common additives <ul style="list-style-type: none"> • Supplement nutritional needs • Improve livestock production • Provide necessary nutrients for proper development and growth • Used as a protein (nitrogen) supplement • Used to influence certain animal performance • Used to inhibit the growth of disease-causing bacteria 	3/3
I.04	Compare the composition, nutrients, supplements, and additives, and cost in different commercial feeds <ul style="list-style-type: none"> • Factors to consider when buying feed • Type of livestock • Palatability • Protein level • Performance expected • Quantity • Condition and size of your storage facility • Price in relation to feeding value • Alternative feed sources • Reputation of the manufacturer • Feed tag 	3/3
I.05	Demonstrate knowledge of proper feed storage and handling practices	3/3
I.06	Demonstrate knowledge of energy values <ul style="list-style-type: none"> • Carbohydrates • TDN • Metabolism 	1/1

	<ul style="list-style-type: none"> • Digestive process • Net energy • Gross energy • Digestive energy 	
I.07	Determine proper nutrient and water requirements for livestock in various stages of production	3/3
I.08	Use a calculator to balance rations	1/1
I.09	Demonstrate knowledge of pasture requirements and grazing systems	3/3
I.10	Demonstrate knowledge of the impact of hormone use on animal and public safety <ul style="list-style-type: none"> • Improve feed efficiency • Increases the rate of growth • Increases milk production 	1/2

DUTY J: Demonstrate Knowledge of Vaccinations and Drugs

CODE	TASK	F/C
J.01	Demonstrate knowledge of immunity, vaccination, and drugs	3/3
J.02	Demonstrate general knowledge of animal health products <ul style="list-style-type: none"> • Reputable • Effectiveness • Precautionary • Dosage levels • Protective • Temperature • Diagnosis • Sanitation • Expiration date • Proper storage • Follow label directions 	3/3
J.03	Demonstrate knowledge of standard medications	3/3
J.04	Interpret information on animal health product labels <ul style="list-style-type: none"> • Milligrams • Milliliters • Site location: SC, IM, IV • Withdrawal periods 	3/3
J.05	Demonstrate knowledge of anaphylaxis <ul style="list-style-type: none"> • Systemic reaction • Local reaction • Symptoms • Epinephrine solution 	1/3
J.06	Calculate mixes and dosage levels for animal health products	3/3
J.07	Demonstrate knowledge of equipment used to administer livestock medications and monitor health care <ul style="list-style-type: none"> • Drenching an animal • Administering paste • Administering a bolus • Installing an insecticide ear tag 	3/3
J.08	Know the parts of a syringe <ul style="list-style-type: none"> • Use and care • Fill 	3/3

J.09	Identify injection sites	3/3
J.10	Demonstrate knowledge of growth stimulants and their application techniques <ul style="list-style-type: none"> • Advantages • Disadvantages • Implant techniques 	3/3
J.11	Demonstrate knowledge of methods other than growth stimulants that improve the rate and efficiency of gain	3/3
J.12	Demonstrate knowledge of new technology and developments in vaccinations and drugs	1/2

DUTY K: Demonstrate Knowledge of Dehorning, Docking, and Castration

CODE	TASK	F/C
K.01	Demonstrate knowledge of dehorning and castration <ul style="list-style-type: none"> • Precautions and safety factors 	3/3
K.02	Identify types of dehorners and tools used in docking and castration <ul style="list-style-type: none"> • Hot iron • Spoon • Tube • Elastrator • Barnes behorner • Saw • Keystone dehorner • Chemical (caustic stick, paste, or liquid) • Chisel • Emasculator • Scalpel • Pincher • Burdizzo • Knife • Single edge razor blade 	3/3
K.03	Identify factors that determine the appropriate method of dehorning <ul style="list-style-type: none"> • Age of animal • Size of horns 	3/3
K.04	Demonstrate knowledge of ways to stop bleeding after dehorning	3/3
K.05	Demonstrate knowledge about docking <ul style="list-style-type: none"> • Precautions 	3/3
K.06	State proper times and methods of castration for cattle, swine, and sheep	3/3

DUTY L: Demonstrate Knowledge of Hoof Trimming, Shearing, and Animal Identification

CODE	TASK	F/C
L.01	Demonstrate knowledge of precautions for safety considerations for hoof trimming <ul style="list-style-type: none"> • Disinfect equipment • Restrain animal properly 	1/1
L.02	Identify hoof trimming tools <ul style="list-style-type: none"> • Electric grinder • Hoof rasp • Hoof knife • Hoof nippers • Chisel 	1/1

	<ul style="list-style-type: none"> • Hoof trimmer 	
L.03	Identify trimming procedures according to the animal's structural factors	1/1
L.04	Demonstrate knowledge of shearing practices	1/1
L.05	Demonstrate knowledge of good practices for maintaining shearing equipment <ul style="list-style-type: none"> • Lubrication • Replace bent, chipped, or broken combs and blades • Use the proper size and shape razor, comb, and blade • Clean thoroughly 	1/1
L.06	Identify basic tools used in livestock identification <ul style="list-style-type: none"> • Electric branding iron • Tattooing pliers • Ear notching pliers • Knife • Hot iron • Hot iron heater 	2/2
L.07	Demonstrate knowledge of the methods of identification for cattle, swine, and sheep	2/2
L.08	Demonstrate knowledge of common earmarks for cattle <ul style="list-style-type: none"> • Tipped • Hole • Swallow fork • Underbit • Overslope • Bobbed or cropped • Split • Underslope • Overbit 	1/1
L.09	Know guidelines for ear tagging sheep <ul style="list-style-type: none"> • Insert 2-3 days to 2-3 weeks after birth • Self-piercing or hole punch • Cleanliness of tags before insertion • Appropriate size and shape for the age of the animal, size of the ear, and usefulness of the site • Through cartilage, avoid injuring veins 	1/1

DUTY M: Demonstrate Knowledge of Marketing Livestock and Market Agencies

CODE	TASK	F/C
M.01	Demonstrate knowledge of types of marketing <ul style="list-style-type: none"> • Order buyers • Cattle dealers <ul style="list-style-type: none"> • Licensing and bonding requirements • Contract sales • Directly to packers • Directly to the consumers • Livestock treaty • Private treaty • Packers and Stockyards Act 	1/2
M.02	Demonstrate knowledge of the marketing of purebred livestock <ul style="list-style-type: none"> • Private sales or auction • Advertise in breed association magazines • Exhibit at fairs and shows 	1/2

M.03	Analyze market information from a local livestock auction and from a terminal market	2/1
M.04	Demonstrate knowledge of types of charges and selling fees involved in livestock auctions	1/2
M.05	Identify factors that determine dressing percentage of cattle <ul style="list-style-type: none"> • Fill • Muscling • Fat 	1/2
M.06	Demonstrate knowledge of factors which affect quality and yield grades <ul style="list-style-type: none"> • Carcass weight • Area of the rib eye muscle • Amount of external fat • Amount of internal or kidney, heart, or pelvic fat 	1/2
M.07	Demonstrate knowledge of shrinkage <ul style="list-style-type: none"> • Fill • Handling • Weather • Distance transported • Species and class • Condition of livestock • Sex • Length of fillback period 	2/2
M.08	Demonstrate knowledge of major causes of livestock bruises	2/3
M.09	Calculate break-even price	1/1
M.10	Calculate selling prices of livestock when given the kind of livestock, number, price per hundred weight, and shrinkage	1/1
M.11	Calculate selling prices of hogs and cattle according to yield and grade	1/1

DUTY N: Demonstrate Knowledge of Market Grades and Classes of Livestock

CODE	TASK	F/C
N.01	Demonstrate knowledge of market grades and classes of livestock <ul style="list-style-type: none"> • Use • Sex • Age • Weight 	2/2
N.02	Demonstrate knowledge of factors that should be considered in selecting feeder cattle <ul style="list-style-type: none"> • Use • Sex • Age • Thrift • Natural fleshing • Breeding • Uniformity • Absence of horns • Temperament and disposition 	2/2
N.03	Demonstrate ability to define approximate age ranges for cattle <ul style="list-style-type: none"> • Vealers • Calves • Yearlings • Two year olds 	2/2

	<ul style="list-style-type: none"> • Older cattle 	
N.04	Demonstrate knowledge of qualifications for quality grades of cattle <ul style="list-style-type: none"> • Maturity • Marbling • Muscle firmness 	1/1
N.05	Demonstrate knowledge of feeder grades of cattle	2/2
N.06	Demonstrate ability to classify live cattle according to slaughter and feeder grades	2/2
N.07	Identify qualifications for market grades of swine <ul style="list-style-type: none"> • Weight • Conformation • Sex 	1/1