

Biotechnology Discussion Group

July 12, 2006 Agriculture: Animal Science

Employment Opportunities *emerging employment opportunities within the biotechnology industry with an animal focus were identified as follows:*

- Animal pharmaceutical sales
- Bio-safety technician – scouting for both plant and animals
- Bio-security technician – for both the rendering and packing companies
- Breeder
- Breeding managers
- Farmer
- Farrowing managers
- Feedlot manager
- Laboratory technician
- Livestock management
- Production specialist
- Quality Control Technician at processing plants
- Sales – genetic systems
- Veterinarian assistant – embryo transfer assistant
- Wean-to-Finish Nursery managers

Specialized skills technicians must possess to successfully gain and maintain employment:

- Commitment to safety. Safety should be emphasized throughout courses.
- Know transfer methods of disease
- Know endocrinology classes of hormones.
- Mastery of identification of individual systems
- Micro-lab experience and equipment use.
- Lab techniques
- Lab safety and terminology
- DNA sample prep
- Animal husbandry skills
- Recognize animals in need of treatment
- Ventilation – a basic understanding of an animal's needs...air movement, exchange temperature and a basic understanding of the latest equipment.
- Animal welfare
- Nutrition – a basic understanding of an animal's nutritional needs.
- Perform post mortem harvest and prep for analysis
- Accurately calculate metric system conversions
- Understand animal behavior and handling – assessment skills
- Observational skills
- Chemical analysis
- Disease identification
- Vaccination skills
- Thermodynamics – heating, cooling, thawing
- Mendelian genetics – understanding of gene expression (dominance – complete, incomplete, co-dominance; epistasis; others)

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- Focus on litter size
- Breeding skills
- Gene splice
- Gene insertion
- Basic genetics
- Communication skills: technical written and oral skills, ability to present
- Pharmacology
- Record keeping (*understand regulations and residue levels, quality assessment*) – preparation for export
- Human relations (*getting along with others, interpersonal skills*)
- Basic math skills (*algebra*)
- Critical thinking
- Problem solving
- Computer skills (*record keeping, excel: write/use formulas*)
- Embryo transfer (*genetics – cost conscious*)
- Anatomy and physiology
- Read and understand labels (*feed, drugs, chemical*)
- Understand proper procedure when applying different drugs or chemicals and consequences if not followed.
- Marketing
- Finishing
- Niche opportunities
- Scheduling truck timings
- Aware of emphasis (visibility of) animal welfare aspects
- Basic pharmacology-chemical components
- Promote good neighbor relationships
- Knowledge of animal reproduction

Courses and *potential courses* were identified, and the term sequence, in which students would have an opportunity to explore and enhance their mastery of the competencies identified as **core**:

- (Any) Identification – individual animal identification tracking records by farm, site, etc are incorporated
- (I and II) Biochemistry (*Reactors*) ...understand chemical classifications, combination science course: Biotech...Biology/Chemistry?
- Physiology (*including endocrinology and hormones*)
- Reproduction as a stand alone
- Pharmacology
- Animal Husbandry, including ventilation
- Genetics (*Expression: Mendelian, DNA structures – Therm*), *lab procedures*
- (II or IV) Ethics
- (II or IV) Governmental Regulations

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Marketing and Recruitment Strategies

- High school science instructors, recertification credit and use as recruiters for program
- Provide mini-sessions for young students to introduce them to science and Iowa Lakes
- Position paper...information
- Summer experience of introduction to ILCC for undecided majors, exploration to attract students to bioscience
- Target women...connect dots with rewards...increase need for mentoring
- High school partners with ILCC here or at secondary school
- Visit high schools doing some biotech training already
- Educate admissions counselor
- Booths at county fairs
- Retention – team concept pairing
- Explain the many options available to them and the many fields available
- Industry trade shows
- Use the hand on training at the farm across as many programs as possible
- Part-time job over summer
- Reverse recruiting: Industry to Education
- Grants – advertise successes build on for next applications
- Increase evening ag/continuing education opportunities
- Marketing – retention – change of career: evening/weekend program – new industry
- Advertise as cutting edge! Stay in rural Iowa, make \$\$
- Host community informational meetings
- Articulate the program with universities
- Employment opportunities
- Exciting new job field
- Retention – recruiting tool: Mentoring (*Limited science background, paired with student...nonfarm to farm...etc*)