

GCSE
FACT FILES

Health and Welfare

For first teaching from September 2013

For first award in Summer 2014

Animal Nutrition



agri
culture
and
land use



Learning Outcomes

Describe the cause, symptoms, prevention, and treatment of mastitis in cows, fluke in sheep, pneumonia in pigs and salmonella in poultry

Describe the effects of tuberculosis and brucellosis on the agricultural economy

Outline how the government and other agencies try to limit the spread of tuberculosis and brucellosis; and

Understand the need for farm biosecurity and describe methods of good practice, for example disinfectant foot baths

Condition	Cause(s)	Symptoms	Prevention	Treatment
Mastitis in Cows	<p>Bacteria that are known to cause mastitis include:</p> <p><i>Staphylococcus</i></p> <p><i>Streptococcus</i></p> <p><i>Brucellamelitensis</i></p> <p><i>Escherichia coli, (E. coli)</i></p>	<p>Range from mild to severe. Degree of illness depends on:</p> <ul style="list-style-type: none"> Nutritional & immune status of the cow Stress levels Pathogen responsible Cleanliness, humidity and ambient temperature <p>Obvious Symptoms:</p> <ul style="list-style-type: none"> Swelling, heat, hardness, redness or pain in udder Milk – watery, flakes, clots or pus A reduction in milk yield. An increase in body temperature Lack of appetite Sunken eyes and listlessness Signs of diarrhoea and dehydration A reduction in mobility, due to the pain of a swollen udder 	<ul style="list-style-type: none"> Proper hygiene to include pre and post teat dipping solution, flushing of milking clusters after each cow, frequent scraping of cubicles, use of clean bedding and absorbent disinfectant on cubicles, teat management Good milking routine Prompt identification and treatment Dry cow management & therapy – cows dried off abruptly, teats cleaned & dry cow antibiotics applied Culling chronically affected cows Regular testing and maintenance of milking machine – teat cup liner replacements & servicing Good record keeping Prevent teat injuries Reduce or eliminate environmental stress Boost cows immune system with minerals and nutrients 	<p>Antibiotics may be systemic (injected into the body), or they may be forced upwards into the teat through the teat canal (intramammary infusion).</p> <p>Long Acting Antibiotics BUT milk from such cows is not marketable until drug residues have left the cow's system.</p> <p>Antibiotic milk should not enter the food chain of either humans or animals as it promotes antibiotic resistant bacteria and kills useful gut bacteria.</p> <p>Cows being treated will be marked with tape to alert dairy workers, and their milk is syphoned off and discarded so as antibiotics do not enter the food chain.</p> <p>Vaccinations for mastitis do exist, but as they only reduce the severity of the condition, and do not prevent new infections they should be used in conjunction with a mastitis prevention program.</p> <p>Segregation of infected animals.</p>

Condition	Cause(s)	Symptoms	Prevention	Treatment
Pneumonia in pigs	<p>Pathogens such as influenza, PRRS virus, Mycoplasma hyopneumoniae or a virulent strain of Actinobacilluspleuropneumoniae</p> <p>Poor environments.</p> <ul style="list-style-type: none"> • Incorrect ventilation and humidity. • High stocking densities. • Diseases are commonly transmitted through the movement of carrier pigs. • Incoming pigs – infected • Fluctuation in weather 	<p>Weaners & Growers</p> <ul style="list-style-type: none"> • Coughing • Rapid breathing • Dehydration • Discharges from the eyes – conjunctivitis • Poor circulation • Blue discoloration of the skin • Loss of condition • Huddling • Fever <p>Sows</p> <ul style="list-style-type: none"> • Widespread coughing. • Some sows obviously very ill • Respiratory rate is elevated, some showing acute respiratory distress <p>Piglets</p> <ul style="list-style-type: none"> • Coughing • Heavy breathing • Loss of condition • Dehydration 	<ul style="list-style-type: none"> • Good hygiene of feeding troughs and bedding area • Proper cleaning and disinfection of everything between each production cycle • Dust free • Limited variation in temperature • Proper ventilation with no draughts or cold spots • Prompt identification and treatment • Good record keeping • Reduce or eliminate environmental stress • Boost immune system with minerals and nutrients • Keep areas clean and disease free • Vaccination • `All in all out routine` – fill and clear houses in batches. 	<p>Antibiotics – administered through feed, water or pastes</p> <p>Regular vaccination programme – piglets at 4-6 weeks old, sows anytime</p>
Salmonella in poultry	<p>Intestinal bacterial disease caused by strains of salmonella</p>	<p>Enteric disease (affects the small intestine) of varying severity</p> <p>Most Salmonella infections are without symptoms</p> <ul style="list-style-type: none"> • weak • lethargic • purplish combs and wattles • decreased appetite • increased thirst • distinct sulfur yellow or green diarrhea • In some cases, joints might be swollen • blindness might occur from swelling in the eye • Egg production will be drastically reduced • death 	<p>Farm – away from other poultry holdings. Poultry litter spread away from building</p> <p>Holdings – perimeter of farm should be fenced and gated securely with parking away from the building</p> <p>Buildings – establish clear zone free from vegetation and around building to discourage rodent and insect traffic, wild bird proof, surfaces smooth hard and impervious</p> <p>Livestock – keep birds all of only one age, obtain from a single source</p> <p>Feed and Water – feed should be supplied from a feed mill that adheres to the Salmonella Code of Practice (heat treated). Water from mains/chlorinated source and should be in a closed in system</p> <p>Hygiene – disinfection of boots and hands upon entering and exiting the building</p>	<p>Flock culling in severe cases</p> <p>Antibiotics by feed, water or injection</p> <p>Segregation of infected animals</p>

Condition	Cause(s)	Symptoms	Prevention	Treatment
Salmonella in poultry <i>(continued)</i>			<p>Visitors –entry only for essential purposes, park away from the building, disinfection procedures when entering and exiting (boots and hands), disposable overalls</p> <p>Minimise movement between sheds</p> <p>Suppliers –cleansing and disinfection of all vehicles and equipment, e.g. wheel bath, Salmonella free litter</p> <p>Hygiene – comprehensive hygiene programme in place including rigorous disinfecting of empty buildings</p> <p>Vigilance and surveillance of flocks</p> <p>Routine sampling:</p> <ul style="list-style-type: none"> • Boot sampling – samples from boots worn throughout the building • Hatchery – from liners of incubators • Faecal • Drag swabs – swabs throughout the building <p>Vaccination – especially if the hatchery or breeder flock Salmonella status is unknown</p>	
Fluke in Sheep	<p><i>Fasciola hepatica</i>, also known as the common liver fluke or sheep liver fluke</p> <p>Parasitic flatworm that infects the liver of sheep The disease caused by the fluke is called <u>fascioliasis</u></p> <p><i>F. hepatica</i> is distributed worldwide, and causes great economic losses in sheep and cattle</p> <p>Life cycle of fluke</p> <ol style="list-style-type: none"> 1. Infected sheep has eggs in faeces 2. egg hatches in water and young fluke infects snail 3. growing fluke leaves snail and attaches to grass 4. grass eaten by a sheep to complete the cycle. 	<p>Fluke infections have different symptoms depending on the stage of infections:</p> <ul style="list-style-type: none"> • Late summer/early autumn, sudden deaths and colic in sheep • Late autumn/early winter, weight loss and poor performance • Winter/spring, weight loss, scouring and 'bottle jaw' (accumulation of fluid under bottom jaw) <p>Other common symptoms</p> <ul style="list-style-type: none"> • Blood loss & Anaemia – pale gums & mucous membranes • Diarrhea • Weight loss • Death • Bottle Jaw • Colic • Liver damage (not apparent until after death) 	<p>Vigilance – newly purchased sheep from high risk areas</p> <p>Stock should be dosed with an effective flukicide and isolated for at least a week.</p> <p>Routine use of flukicides - drug rotation</p> <p>Avoidance of under-dosing</p> <p>Re-treat four to eight weeks after the initial dosing if necessary</p> <p>Drain fields and treat all stock that have been on waterlogged fields</p>	<p>Triclabendazole;</p> <p>Treat all grazing animals in October and January.</p> <p>Out-wintered animals may need additional treatments between October and January Monitor fluke levels regularly by having liver fluke egg counts (individual or bulk) carried out on faeces samples from mid-January</p> <p>Investigate all cases</p> <p>Investigate all cases of sudden deaths by post-mortem examination</p> <p>Be aware of flukicide resistance and report any suspicion of treatment failures</p> <p>Quarantine treatments for bought-in animals</p> <p>Ensure abattoir inspects for liver damage</p>

Biosecurity – Prevention of disease causing agents entering or leaving any place where farm animals are present by ensuring good hygiene practices are in place.

Benefits

- Prevents the spread of animal disease
- Improves farm efficiency
- Protects neighbouring farms and the countryside
- Keeps new diseases out
- Cuts the cost of disease prevention and treatment

Good Biosecurity Measures

- Awareness of the need for biosecurity
- Herd/flock plan in conjunction with vet including isolation procedures
- Disinfectant footbaths
- Limit and control visitors – people and vehicles
- Keep access routes, parking, yards, feeding and storage areas clean and tidy
- Use high pressure washers, brushes and hoses with recommended disinfectant
- Maintain fences to limited contact of livestock with neighbouring livestock
- Cleanse and disinfect injecting and dosing equipment – do not share
- Clean and disinfect farm equipment after sharing with neighbouring farm
- Implement a pest control programme
- Fence off streams and rivers – supply clean fresh drinking water in troughs
- Keep livestock away from freshly spread slurry for at least 6 weeks
- Good record keeping
- Correct disposal of fallen stock
- Incoming stock – isolate from herd/flock
- Testing programme for incoming stock
- Isolation buildings – close to farm entrance and away from other livestock buildings
- Isolation paddock – double fencing, at least 3 metres
- Careful disposal of bedding

Economic Impact of Tuberculosis & Brucellosis (UK)

- 1999 TB Order & 2004 Brucellosis Order – provide the Department of Agriculture with the powers to slaughter affected cattle
- Compensation Policy (Taxpayer Monies) – Both Orders determine compensation for affected animals which are slaughtered. Currently under review with false claims and intentional infection of animals.

TB Cases:

- 2010/2011 – number slaughtered = 7,345
- 14% pedigrees
- Compensation = £8.4 million
- 2011/2012 compensation = £12.9 million

Brucellosis Cases

- 2010/2011 – number slaughtered = 1,390
- 11% pedigrees
- Compensation = £1.5 million
- 2011/2012 compensation = £0.5 million

Key Terms

- Brucellosis
- Mastitis
- Tuberculosis
- Fluke
- Pneumonia
- Antibiotic
- Biosecurity



Learning Activities

In class

- Mock Agricultural Committee Presentation of Statistics
- Case studies of Outbreaks of Salmonella
- Poster activities – design “the ultimate biosecure farm”
- Video pupil presentations on “good biosecurity practices”
- Wall Displays/Website blog
- NI Assembly Education Team Visit
- Research Projects – ICT Based
- Maths Exercise – study the number of cases of TB and Brucellosis in NI and present findings for wall display/group presentation/mock committee review
- Maths Exercise – costing a case of treating mastitis
- Farm visits
- Farmer visits
- Veterinary nurse/surgeon visits

Brucellosis

- A highly contagious disease of cattle caused by the bacterium *Brucella abortus*.
- Spreads between animals.
- Dangerous to humans – contact with infected animals or material

TB

- Complex disease caused by the bacterium *Mycobacterium bovis*, also affects deer, goats, pigs, dogs, cats and other mammals (notably Badgers)
- Spreads between animals and can sometimes be passed to humans

Government Approach: Long term goal Total Eradiation.

- Unique partnership approach; Ulster Farmers Union, NIAPA, National Beef Association NI and the Association of Veterinary Surgeons Practicing in Northern Ireland (AVSPNI) – TB Core Stakeholder Working Group. Working towards the eradication of TB in Cattle in Northern Ireland
- Well established annual herd testing programme
- 1999 TB Order and 2004 Brucellosis Order – introduction of tighter controls on overdue TB tests
- Assessments conducted in the role of badgers in the spread of bovine TB
- Phased strategy towards eradication – Holistic approach between government and Industry



Web Resources/Links

<http://www.dairyco.org.uk/technical-information/animal-health-welfare/mastitis/>

<http://www.sheep101.info/201/diseasesa-z.html>

<http://www.organicvet.co.uk/VetMan/Bio.htm>

<http://www.defra.gov.uk/animal-diseases/biosecurity/>

<http://www.daleheadvetgroup.co.uk/Factsheets/farm/liverfluke.pdf>

