

Animal Environments and Health

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Animal environments can and do affect many aspects of farm animal health and productivity, but the effects on respiratory health, udder health, and feet and leg health is particularly great.

Respiratory health is dependent both on animal resistance factors and exposure to respiratory pathogens and irritants. Bacterial/particle counts of 1,000 to 700,000/cubic meter have been recorded in confined swine housing; while outdoor air typically has a bacterial/particle count of 150/cubic meter (Curtis). Relative humidity in confinement housing may affect bacterial and viral concentrations. Confinement calf housing at 50 to 60% relative humidity had lower bacterial concentrations than similar housing at 80% relative humidity. Both ammonia and hydrogen sulfide gases can inhibit bacterial clearance mechanisms of the respiratory tract. Cold air may reduce tracheal mucociliary clearance.

Udder health is influenced by a variety of environmental, contagious and host-defense factors. In many dairy breeds, contagious mastitis organisms have been controlled or eliminated. The low somatic cell count quarter is highly susceptible to environmental organisms, especially during early lactation and during the first week of the dry period. Bedding materials and other contact surfaces that have very high bacterial contamination may be associated with clinical mastitis, with non-ag streptococci, or with gram negative

organisms. Bedding with 10 to the sixth or greater concentration of bacteria per gram has been associated with increased clinical mastitis.

Feet and leg health is also environmentally affected. More free stall herd owners than stanchion or tie stall owners reported that feet and leg problems were serious in their herd (McDaniel). Wet concrete is 83% more abrasive, on average, than dry concrete. In cattle that are confined on concrete most, or all, of the time, wear of hoof may exceed growth. This is especially true if the concrete is new and/or wet. Other environmental factors affecting feet and leg health are stall size and design as well as mud and manure exposure.

Dairy animals should have an environment that is clean, dry, and draft free; it should be "comfortable!" Pennington (1982) refers to two environments in the housing system, biological and physical. Managerial environment (attitude, skills, and knowledge) should be added to this list.

Physical environment includes: Climate, Shelter, and Space; Biological environment includes: Feed, Water, Parasites, and Disease; Management environment includes: Attitude of the caretaker and Facility affect on caretaker attitude.

Housing system design, construction, and operation can impinge on all of these areas (Baxter, 1983, Light, 1973, Thompson, 1974). To encourage and facilitate good management, the housing facility must allow for convenient feeding, cleaning, milking, observation and restraint. This

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