and lipolysis. Second, disease-induced anorexia could decrease serum IGF-I and increase serum GH which causes irreversible change in the partitioning of nutrients for tissue deposition. Ward et al. (1992) found that fasted cattle have higher serum cortisol concentrations than do fed cattle. Cortisol may be involved in anorexia-associated decreases in carcass weight and fatness through decreased thyroid hormone activity and increased protein catabolism. Third, cytokines and endotoxin induce various behavioral symptoms of sickness including lethargy, adipsia, and reduced social interactions. The result may be an indirect effect of anorexia on growth and carcass traits in that sick cattle are effectively on feed for fewer days than healthy penmates.

Key Words: Respiratory Disease, Cattle, Carcass Value

486 Effects of nutrition and management on carcass value and profitability. L. L. Berger* and N. A. Pyatt, *University of Illinois, Urbana*.

As increasing numbers of cattle are being marketed on a grid basis, carcass value rather than live weight is becoming the primary determinant of profitability. Carcass value is determined by weight, quality grade, yield grade, choice-select spread, and premiums and discounts. Early-weaned steers (n = 192, Simmental or greater) of known genetics were individually fed in a four-year study to determine performance and carcass factors explaining variation in carcass value and profitability. Steers were weaned at 88.0 ± 1.1 d and fed a high concentrate diet ($108.99/T) for 84.5 ± 0.4 d prior to allotment. Steers consumed a 90% concentrate diet ($98.93/T), consisting primarily of whole shelled corn and corn silage, for 249.7 ± 0.7 d and harvested at 423.3 ± 1.4 d of age. Five-year price data were collected for feedstuffs, dressed beef, and grid premiums and discounts. Average dressed beef price was $110.67/45.4 kg. Premiums ($/45.4 kg) were given for Prime ($5.62), premium Choice ($1.50), yield grades (YG) 1 ($2.46), 2A ($1.31) and 2B ($1.11). Discounts ($/45.4 kg) were given for Standard (-$17.72), Select (-$8.90), YG 3A (-$0.12), 3B (-$0.19), 4 (-$14.16) and 5 (-$19.56), and hot carcass weight (HCW) extremes (409-431 kg, -$0.64; 432-454 kg -$11.39; > 454 kg, -$19.71). Input costs included annual cow costs ($327.77), veterinary/medical and labor ($35/hd), feed markup ($22/T), yardage ($0.25/hd/d) and interest (10%). Dependant variables were carcass value and profit per steer. Independent variables were yearling weight EPD, marbling EPD, daily DMI, ADG, feed efficiency, HCW, 12th rib fat, calculated YG and marbling score (MS). Carcass value was correlated ($P < 0.05$) with yearling weight and marbling EPD, DMI, ADG, feed efficiency, HCW and MS. Carcass weight, MS and YG accounted for over 79% of the variation in carcass value among steers; explaining 57, 12 and 10%, respectively. Profit was correlated ($P < 0.05$) with DMI, ADG, feed efficiency, HCW and MS. Marbling score, DMI, ADG, YG and HCW accounted for over 77% of the variation in profit among steers; explaining 30, 14, 12, 12 and 9%, respectively

Key Words: Carcass Value, Quality Grade, Yield Grade

Companion Animal Symposium

487 Nutritional management of obese animals. G. D. Sunvold*, *The Iams Company Research and Development, Lewisburg, OH*.

Being overweight or obese is the single most common nutritional disease in companion animals. Traditional weight management technology involves diluting dietary calories with fiber. The potential side effects of high fiber diets will be noted in the presentation. An alternative weight management strategy, managing the underlying physiological changes that occur in overweight animals or put these animals at risk for obesity, will be discussed. The close relationship between obesity and glycemia makes it important to study glucose and insulin metabolism in order to effectively treat obesity. This metabolic association will be discussed. The role of several nutrients for use in weight management has been examined and will be an important aspect of this presentation.

Key Words: Dogs, Cats, Obesity

488 Humans and companion animals: hand-in-paw towards aging and obesity. B. T. Larson*, D. F. Lawler, Y. Pan, and J. R. Jackson, *Nestle Purina PetCare Co*.

The effects of aging are relentless. In response to aging, living organisms make functional, physiological and zoometric adaptations. Beyond these seemingly pre-ordained genetic and physiological adaptations, there are increasing adverse effects upon aging mediated through obesity. The relative abundance of inexpensive, entertaining, and delectable food energy sources combined with a lack of immediacy or initiative to use calories through physical activity has caused an epidemic of obesity. Statistics regarding obesity in humans and companion animals compels science to explore available options. Scientific knowledge surrounding obesity and aging is growing at a remarkable rate. New revelations have been made of adipose tissue's regulatory effects on whole-body physiology (insulin resistance, ex.). In addition, obesity is related to chronic disease development (osteoarthritis, organ function, cancers, ex.) through insulin sensitivity. These new developments have opened new venues in the science of aging and obesity. Additionally, the aging-related loss of lean tissue mass physiologically intersects with age-associated fat tissue deposition to multiply downstream physiological effects. Unfortunately, this exponential knowledge growth exceeds population implementation rate. How companion animal science approaches these issues is critical to implementation. What is the science component in the aging and obesity implementation equation? Given, that science agrees to disagree about mechanistic theories, how is interim credibility preserved with partners outside science? Who are sciences potential partners in the aging and obesity implementation equation? What might this partnership look like in order to curb the acceleration of obesity in aging companion animals?

Key Words: Companion Animals, Aging, Obesity

Dairy Foods and Human Nutrition

489 Fortification in dairy products. C. Boeneke*, *Louisiana State University Agricultural Center, Baton Rouge*.

Webster's dictionary defines fortification as the act or process of adding materials to for strengthening or enriching. Fortification of dairy products is not a new idea. The process of fortification of milk with vitamin D dates back to the 1930's. The acceptance of this practice led to additions of vitamin A and minerals in the 1940's. No vitamin content levels were specified by the Milk Ordinance and Code until 1953 when a level of at least 400 International units (IU) per quart was established for vitamin D. In 1965, the Milk Ordinance and Code became the Grade A Pasteurized Milk Ordinance or PMO. This PMO defined low fat milk but gave no provisions for its fortification. An increase in consumption of the lower fat products led to nutritional concerns over vitamin A. The content of vitamin A, a fat-soluble vitamin, is smaller in the lower fat product. The 1978 PMO required fortification of these lower fat products at levels of not less than 2000 IU per quart for vitamin A. Vitamin D fortification was still optional and could be added at 400 IU per quart. Consumers are demanding products that taste good and have health benefits. Dairy products are already rich in nutrients like potassium, riboflavin, calcium and vitamins A, D, and B-12. Fortification has the potential to improve them further. Dairy products fortified with added calcium, whey proteins, beneficial bacteria, and isoflavonoids are already on the shelves. Other ingredient additions such as vitamin C and E, lactoferrin, lutein, and others are available. Fortification poses unique problems to scientists and manufacturers involved with dairy products. Interactions with the ingredients used in fortification can cause product improvement or product detriment. More research must be conducted to examine the results of fortification in dairy products.

Key Words: Fortification, Dairy