Original Research

Chiropractic Directed at Subluxation Reduction Improves Speed of Harvest Rate, Reduces Feed Costs and Increases Feed Efficiency in Piglets: A Controlled Field Study of Rate of Gain in 109 Piglets

Andrea Arbuckle, DVM, AVCA[1]
Wyatt Fechter[1]
Rachel Hendricks[1]
Tate Stewart[1]
Hannah Whetstone[1]
Dakota Wiseman[1]

1. *Private Practice, Grenola, KS*

Abstract

Objective: The objective of this study is to evaluate the potential benefits of animal chiropractic on the rate of gain in pigs in a controlled field study.

Methods: 109 piglets weaned on the same day were enrolled in the study. The piglets enrolled in the study were mixed sexes born to first time gilts. The piglets ranged in age from nine weeks, three days of age to 13 weeks of age and weighed 40-80 pounds at weaning. All piglets were captured and randomly assigned into control (CON) and adjusted (ADJ) groups.

Results: On average the ADJ group reached harvest weight 6 days sooner than the CON group. On the operation studied, feed costs for the adjusted group were reduced and feed efficiency was improved.

Conclusion: In this study chiropractic care was associated with improved speed of harvest rate, reduced feed costs and increased feed efficiency in piglets. Studying food animals in production settings can result in robust data because we can study large groups in controlled settings. Large scale studies could also determine if chiropractic can be implemented to improve sustainable agriculture by reducing antibiotic usage, improving feed efficiency, and improving consumer perceptions.

Keywords: *animal chiropractic, piglets, farrow, livestock, vertebral subluxation, adjustment, manipulation*

Introduction

Direct on farm employment accounts for 1.3% of United States Employment. Whereas food accounts for 13% of expenditures in the average American household. Land base dedicated to Agricultural use declined 11% from 1949 to 2012 (the latest year comprehensive data is available). However, urban land use has tripled in that same time frame, though it still represents the smallest sector of United States land use.[1] It is also important to note the United States population increased by 6.3% between 2010 and 2020.[2]

As population continues to increase, 1.3% of the United States workforce is expected to produce food for the remaining 98.7% of the population with less land resources available. This research team is exploring the effects of animal chiropractic on livestock overall health, rate of gain, reproductive efficiency, and palatability of meat across multiple species. They will utilize animal chiropractic in production settings to offset challenges the American livestock producer faces while maintaining sustainability of our food supply.

These challenges include but are not limited to decreased profitability due to less or more expensive resources available, increased antibiotic resistance, limitations on antibiotic usage, and negative consumer perception due to lack of education

regarding food production. This paper will focus on research conducted on pigs from weaning to harvest.

Chiropractic addresses vertebral subluxations in the spinal column by delivering a high velocity, short lever thrust by hand or with an instrument. A subluxation is defined as a shift in the normal structure of one vertebrae in reference to the vertebrae on either side of it. This shift can cause a biomechanical change that can interfere with the nervous system.[3] Studies in livestock production settings, such as this one, have the potential to evaluate the effects of those biomechanical changes by comparing a control (non-adjusted) group to a treatment (adjusted) group. This swine study was designed to evaluate the differences in rate of gain in a well-established, natural hog operation.

Materials & Methods

109 of 111 piglets weaned on the same day were enrolled in the study, two were rejected because of an umbilical hernia and an abscess. The piglets enrolled in the study were mixed sexes born to first time gilts. The piglets ranged in age from nine weeks, three days of age to 13 weeks of age and weighed 40-80 pounds at weaning. All piglets were captured and randomly assigned into control (CON) and adjusted (ADJ) groups.

Those assigned to ADJ were adjusted and ear notched prior to being turned loose. Those assigned to the CON group were ear notched prior to being turned loose. Protocol for this operation prohibited the use of individual identification, therefore, a notch was placed in the left ear for the CON group and the right ear for the ADJ group. The owner was not present for the assignment and adjustments and was instructed to notify the research group when ear notches were being moved to the fattening pen, at which time the ADJ received a second adjustment. The CON was sorted and handled in the same manner during that move, but not adjusted. The owner also reported when either of the groups was sent to harvest.

This operation farrows in an open pasture with houses available for the sows to seek shelter. Groups of weaned piglets are sent to a growing pen then a fattening pen before being sent to harvest. This operation is contracted to sell finished pigs every two weeks all year long, and occasionally sell for private not for resale harvest as well. This producer utilizes a standard deworming and vaccination schedule and grinds all of their own feed for their operation. Movement to the growing pen is based on age of piglets, whereas movement to fattening pen and marketing for harvest is based on weight. The producer does not weigh each animal individually because he is skilled at estimating weight accurately.

Results

One pig from the ADJ group broke its leg and was removed from the study. On average the ADJ group reached harvest weight 6 days sooner than the CON group. The ADJ group (53 head) averaged 168 days from weaning to harvest, and the CON group (55 head) averaged 174 days. The chart below depicts the number sold each day. This group was weaned on 1/27/2020 and the sale dates were June through September of 2020.

Discussion

This study is a good start to showing the positive effects on animal chiropractic in a livestock production setting. However, there is still a lot to be examined in future studies; the authors conducted a concurrent study showing chiropractic adjustments in chickens beginning at 2 days and then every 2 weeks until harvest resulted in reduced mortality, increased rate of gain in roosters, overall higher dressing percentage, and improved palatability in ADJ vs CON groups.

This study in pigs shows increased rate of gain; however, this group hopes to repeat this study in the future on a larger scale. Their hope is the future study could also include weaning weights, harvest weights, and potentially carcass data. It is well known stress affects overall palatability, but short term and long-term stress affect the meat quality in different ways. Long term stress depletes muscle glycogen, resulting in meat which has a higher pH, darker color, and is drier.

However, short term stress produces lactic acid from the breakdown of glycogen which results in meat having lower pH, lighter color, reduced water binding capacity, and decreased tenderness.[4]

It will be important in the future to measure stress markers or evaluate differences in carcass data between adjusted and control groups.

Conclusion

Animal chiropractic in a livestock production setting has strong potential to address many challenges the American agriculture producer faces while raising a high-quality end product. This study, a concurrent study by the authors in chickens, and a chicken study performed by Dr. Ormston and Dr. Hayek[5] show chiropractic adjustments improve palatability, overall health, and rate of gain in livestock.

This study needs to be repeated on a larger scale to determine effects of chiropractic in commercial swine production to truly evaluate effects on sustainable ag production with increased rate of gain. On the operation studied, feed costs at the time were $0.65/head/day for 8.5lbs/hd/day which equaled a $3.90 savings per animal raised and improved feed efficiency resulting in 51lbs/hd less feed to reach harvest weight.

This operation sells approximately 650 head of finished pigs per year; implementing chiropractic on this operation could result in feed savings of $2535 per year and a reduction of 16.6 tons of feed utilized. According to USDA statistics in the 3rd quarter of 2019 there were 35.3 million piglets weaned;[6] animal chiropractic implemented on a large scale could result in a huge reduction in feed utilization, therefore making a more sustainable and more affordable end product.

The main challenge the livestock industry faces in implementing chiropractic on a large scale is the lack of availability of certified animal chiropractors and even less availability of those trained in livestock chiropractic. Studies are also underway evaluating the effects of chiropractic

adjustments on immune health in high-risk stocker cattle.

References

1. USDA Economic Research Service. (2020 December 16). Ag Food Sectors and the Economy. Retrieved from https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/
2. USDA Economic Research Service. (2020 December 16). Ag Food Sectors and the Economy. Retrieved from https://www.census.gov/library/stories/2020/04/nations-population-growth-slowed-this-decade.html
3. Romano L, Taylor L. Veterinary Chiropractic. Can Vet J. 1999;40:732-735
4. Temple Grandin. (1980). The effect of Stress on Livestock and Meat Quality Prior to and During Slaughter. *The Humane Society Institute for Science and Policy: WBI Studies Repository* Retrieved from https://www.wellbeingintlstudiesrepository.org/cgi/viewcontent.cgi?article=1019&context=acwp_faafp
5. Amy Hayek , DVM, MA,CVA, CVC; William Ormston, DVM, CVC; Justin Nolen. Growth and Quality Enhancement in Broiler Chickens, Midwest Veterinary Conference 2020
6. Jim Barrett. (2019 September 27). United States Hog Inventory Up 3 Percent. *USDA National Agricultural Statistics Service: Newsroom.* Retrieved from https://www.nass.usda.gov/Newsroom/2019/09-27-2019.php