

Outline:

Introduction:

- growing population results in more demand for chicken

- State stats regarding current farm numbers

Explanation on why animal welfare is important

- Food safety

- Ethical concerns

Explanation on how animal welfare is current monitored:

- (use research doc)

Explanation about audioT

- Their mission

- How they use audio data to monitor welfare

- Why their technology is needed and represents the future of animal welfare monitoring(conclusion)

Introduction:

With an estimated 25% increase in global population over the next 30 years, food suppliers across the world will be expected to increase production accordingly to provide for a rapidly growing consumer base. Poultry offers many advantages in comparison to alternatives such as beef and pork. Poultry provides greater yields in energy efficiency for growers, flexibility in growing techniques between layer and broiler farms, and a lean source of protein for consumers. Now, there are an estimated 25000 poultry farms which source around 95 percent of the countries' chicken supply. As food production scales to meet rising demand, integrators like Cargill and Tyson Foods have capitalized on the poultry market by contracting individual farmers .

Explanation on why animal welfare is important:

Animal rights (ethical reasons)

In 2018, it was reported that the average American consumed 65 pounds of chicken . As a whole, around 8 billion chickens are eaten per year [7]. There are many consumers that want the reassurance that the chicken they eat is healthy and well taken care of, whether it be for ethical reasons or personal health reasons. There will always be the push for better standards for the producer to raise high quality food

High quality food == high quality prices

Biosecurity

“Over 1 billion of the world's poor depend on animals for jobs, food, income, transport, social status and cultural identification. Good

welfare practices improve animal survival, reduce production costs and increase profits, and so enhance the productivity of the poor's only productive asset and help eradicate poverty"

"Animals matter to sustainable development

Animal wellbeing impacts on the most pressing issues of our time. In just one key example, livestock is crucial to food security.

Unfortunately, our collective response to the growing demand for animal protein has been the expansion of low-welfare intensive livestock production and farming practices. Choosing this unsustainable path has led to a number of unintended consequences affecting:

- global food security, as grains are diverted from people to livestock
- the occurrence and global costs of zoonotic diseases, such as Salmonella, E. coli, Campylobacter and avian and swine flu

In addition to consumer concerns, those working in the poultry industry are also heavily influenced by animal welfare standards. Implementing good welfare practices has shown to decrease production cost and increase profits. This is due to the demand from consumers for high quality and ethically raised poultry.

Explanation on how animal welfare is current monitored:

How are we monitoring welfare right now? One way is chicken welfare being monitored through observation of human auditors. These auditors will inspect flocks and spot any abnormal behavior of individual chickens. The issue with this method is that there can be over ten of thousands of chickens on one farm which makes assuring that each chicken's health is accounted for is very labor intensive and nearly impossible. Involving automation with monitoring methods is essential in achieving efficiency and accuracy. Other methods of utilizing automation to monitor welfare. There are welfare detecting devices made to detect whether a chicken has been infected with various diseases and viruses. Other systems to monitor chicken welfare are able to classify different stresses by support vector machine (SVM) techniques automatically and non-invasively. This system is known to be 96 percent accurate. (mention broiler bucket method)

Explanation about audioT

(Mention the evolution of broiler method)?

As an advocate for the people that keep the poultry industry running, AudioT strives to empower individual growers by giving them the tools they need to ensure that their chickens are properly cared for. AudioT sets themselves apart through the utilization of machine learning algorithms, Through the meticulous placement of microphones, AudioT's aims to analyze audio data to consistently track chicken wellness and behavioral patterns. Their technology will aid in providing poultry farmers with a robust solution to demonstrate their standards for animal

welfare to their integrators. This data is aggregated at a large scale and distributed throughout the supply chain, creating a positive impact on the industry as a whole.

Home Page Video Flow ?

- Chickens walking around with clucking
 - While explaining the concept of a broiler house how large they are
- Pan out to show how large it is
 - Continue explaining how welfare is currently monitored
- Include happy and sad chickens and show the different sounds of each
 - And explain how chicken vocalizations
- Show the grid of data tom showed and explain what the darkness/colors mean
- Show and emphasize the “bad areas”
 - Explain how this mean distress in the morning at that time
- Show animation of that time period and the issue in the barn with distressed chicken noise
- Show them fixing the issue
- Show new data grid
 - Discuss the change and how the grid updated to show the new data and that the chickens were less distressed after the issue was fixed

Script

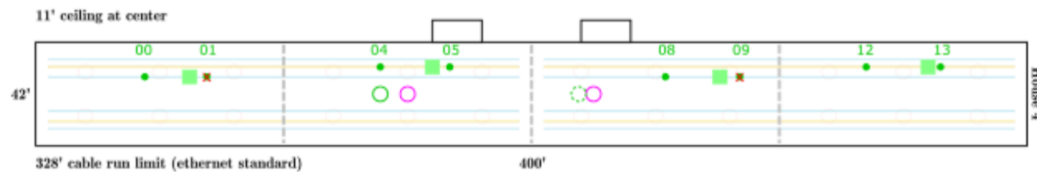
In 2018, it was reported that the average American consumed 65 pounds of chicken . As a whole, around 8 billion chickens are eaten per year [7]. There are many consumers that want the reassurance that the chicken they eat is healthy and well taken care of, whether it be for ethical reasons or personal health reasons. There will always be the push for better standards for the producer to raise high quality food

How are we monitoring welfare right now? One way is chicken welfare being monitored through observation of human auditors. These auditors will inspect flocks and spot any abnormal behavior of individual chickens. The issue with this method is that there can be over ten of thousands of chickens on one farm which makes assuring that each chicken’s health is accounted for is very labor intensive and nearly impossible. Involving automation with monitoring methods is essential in achieving efficiency and accuracy.

As an advocate for the people that keep the poultry industry running, AudioT strives to empower individual growers by giving them the tools they need to ensure that their chickens are properly cared for. AudioT sets themselves apart through the utilization of machine learning algorithms, Through the meticulous placement of microphones, AudioT’s aims to analyze audio data to

consistently track chicken wellness and behavioral patterns. This shows AudioT's vision of the microphone placement in the broiler house.

MICROPHONE PLACEMENT

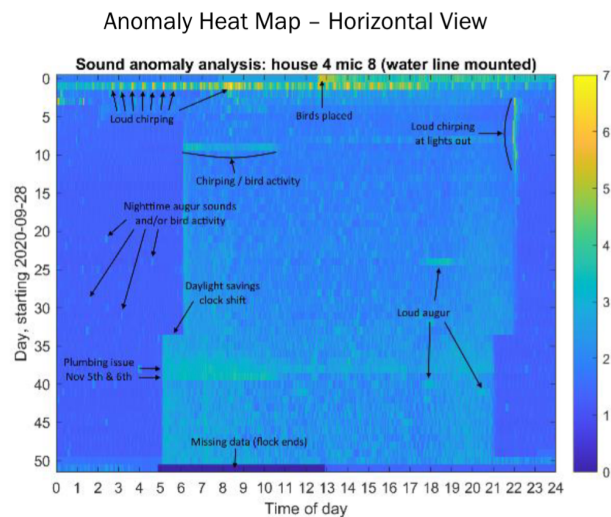


8 regularly spaced microphones define 8 zones within this house
Placed at bird level

There is a lot of data that can be derived from monitoring chicken vocalization.

MULTIPLE DAY ACTIVITY LEVELS

- Fine level anomaly detection to pin-point areas for specific investigation or to monitor specific conditions



Brightness indicates how unusual events were in by minute block of time

In this heat map, you can see the different anomalies you can detect from just monitoring chicken's audio. This heat map is shown from when the chicken first entered the broiler room. In the first few days, there is an excessive amount of chirping from the chickens due to the change in environment. Once the chickens start adapting to the environment you can see a common pattern of when they wake up to when the lights are turned off and it is time for the chickens to go to sleep. Another key event this heat map shows is how there was more anomaly because of a plumbing issue in the boiler house. This is shown by the brighter blocks in between days 35 and 40. There is a lot of data that

contact growers can get on their chicken's welfare by just monitoring the audio in the broiler house.