Ways to turn your data into profit

with Data Science, IoT and Artificial Intelligence

MTech Systems
a Munters company

According to scholars at Tufts University, smarter farming practices could generate $2.3 trillion in cost savings and business opportunities annually and $250 billion of those yearly savings could come from AI and data analytics alone.

The industry potential for data science

Data science is at the forefront of helping producers to better understand data and develop insights, which in turn helps them take the right actions at the right time.

Scientific methodologies and models can be applied to any variable affecting performance issues. When executed correctly, data science initiatives can impact a poultry company's bottom line resulting in increased profit.

The poultry industry has just touched the surface of what is possible with applied data science practices.

As the potential is soon realized, data science, IoT and artificial intelligence tools will be utilized as secret weapons for rapid growth

Data science demystified

What is data science and what are the main benefits for the poultry industry? Data science, in its most basic terms, can be defined as obtaining insights and information, really anything of value, out of data.

Benefits from data science practices include everything from gaining faster insights, making to better predictions, to executing the best decisions possible for the growth of your production business.

With global food demand set to surge almost twofold by 2050, it will be incumbent upon farmers and agricultural suppliers to harness data and innovation to improve productivity and feed a growing global population.

Harvard Business Review

Transforming big data into profit

MTech has been creating disruptive software technologies for the poultry industry for 30 plus years.

Recently, we interviewed our data science team to get examples of how data science is currently being used across the industry to:

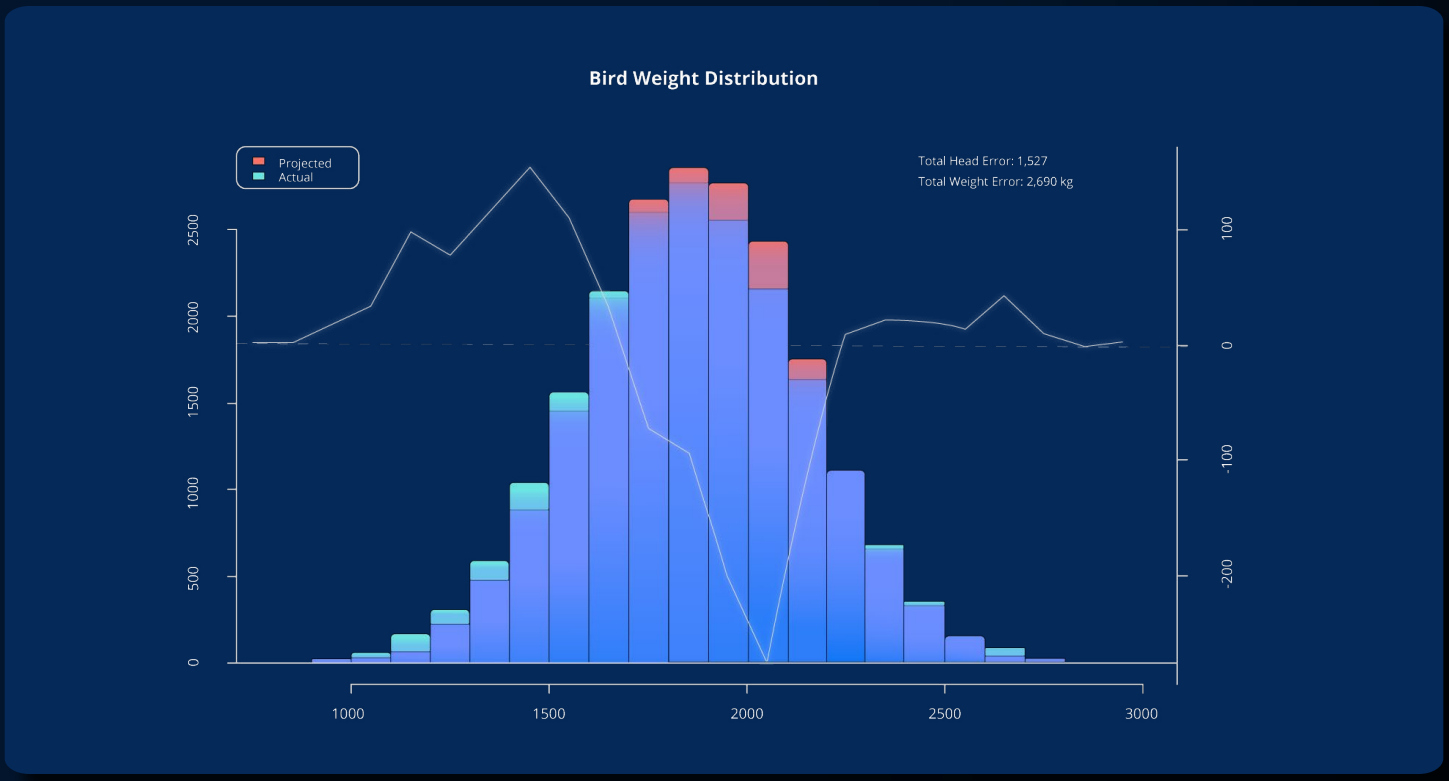
- **Optimize flock performance**
- **Improve sustainability**
- **Increase farm efficiency and profit**

We will highlight a few examples in this report.

Business impact for poultry producers

6 use cases to increase profit with Data Science, IoT and Artificial Intelligence

1. Precision bell curves help to determine exact bird weight



Data science can predict the weight distribution of the flock and can tell you on what days what % of your flock is within those parameters.
Rather than just predicting the weight, we can project the whole bell curve or the weight distribution for a flock. And this can help you decide which day to bring in that flock based on your contracts.

For example, Tuesday, it might be that 70% of the flock is within the target range that you're hoping for and, Wednesday's is 80%. And then Thursday, the birds get too heavy, and now only 75% are within your target range.

So, by figuring out what percentage of the birds are within your contractually obligated weight ranges, you can pick the ideal day to harvest, rather than just doing it based off the average weight.

Potential business impact:

Cut costs on giveaway and increase yield, achieve optimal strike rate, lower costs per flock due to fewer condemnations, save money on contracts by meeting bonus weight thresholds

2. Optimize breeder flock placement

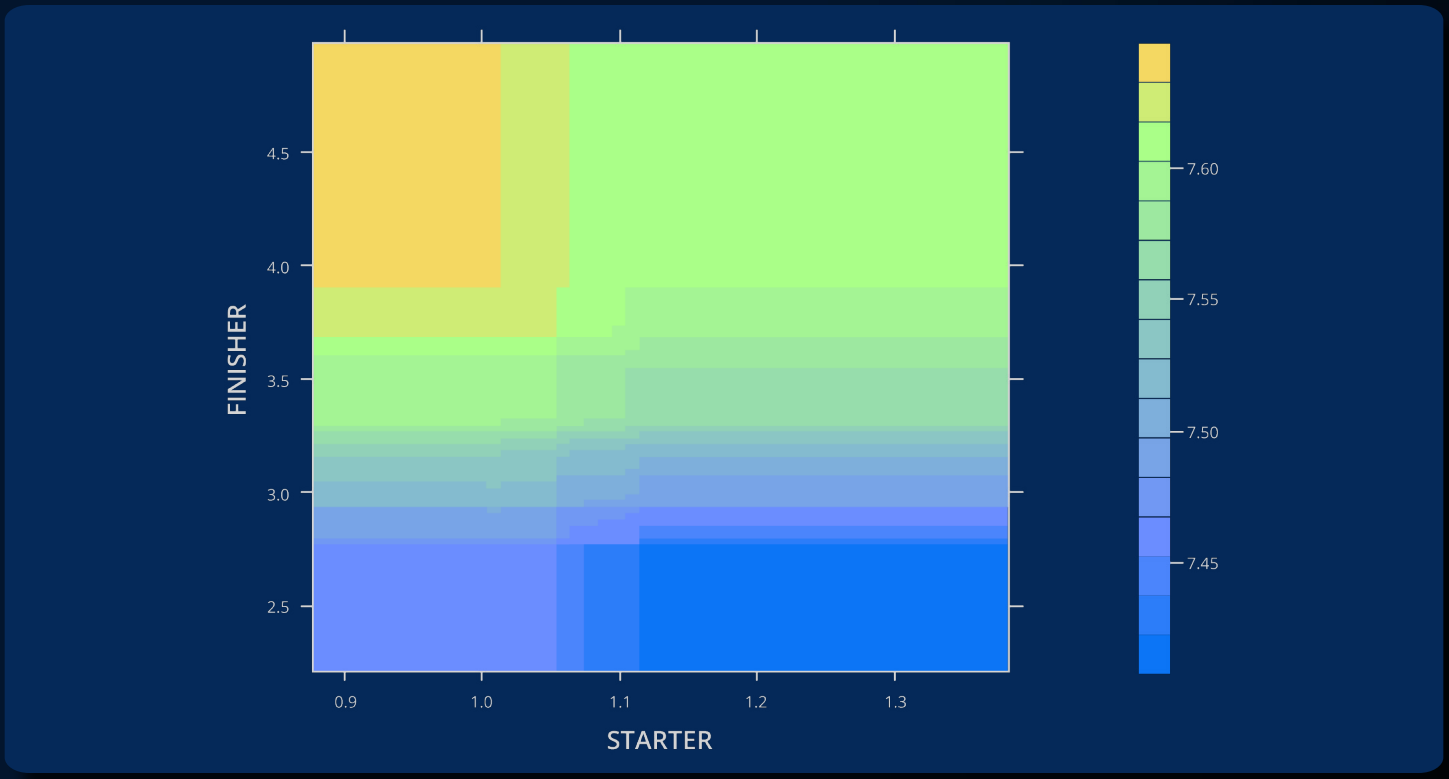
Insights from your companies' data can help to improve hatchability and assist you with optimal breeder flock placement.

Take advantage of tools that help you meet your demand internally instead of having to buy eggs elsewhere.

Potential business impact:

Gain a more consistent egg supply- buying eggs externally costs more money, instead save on storage or disposal costs, and opt-out of the hassle of trying to re-sell extra inventory before it goes bad. Using data science for better projections, you can set up contacts ahead of time, as well as you can optimize your egg banks.

3. Improve feeding program performance by finding winning combinations



Data science can be used to compare any combination of variables simultaneously to determine the optimal decision.

In the scenario above, finisher feed is compared with starter feed to see which one impacted bird weight the most (different colors represent bird weight) (side number represents lbs of feed). So this is telling you that if the birds ate one pound of starter and four pounds of finisher, they weighed the most compared to birds that eat 1.2 pounds of starter. And by looking at this chart, you know after four pounds of finisher, they weighed a little bit less.

Before taking this data at face value, you should make sure to consider other factors; such as maybe the birds were brought in earlier, or maybe the ones that are 1.2 are bad growers and they lost count of their feed. But you can start taking in the calculations especially, in the really busy area of what ratio of starter to finisher might make the most sense to increase feed performance.

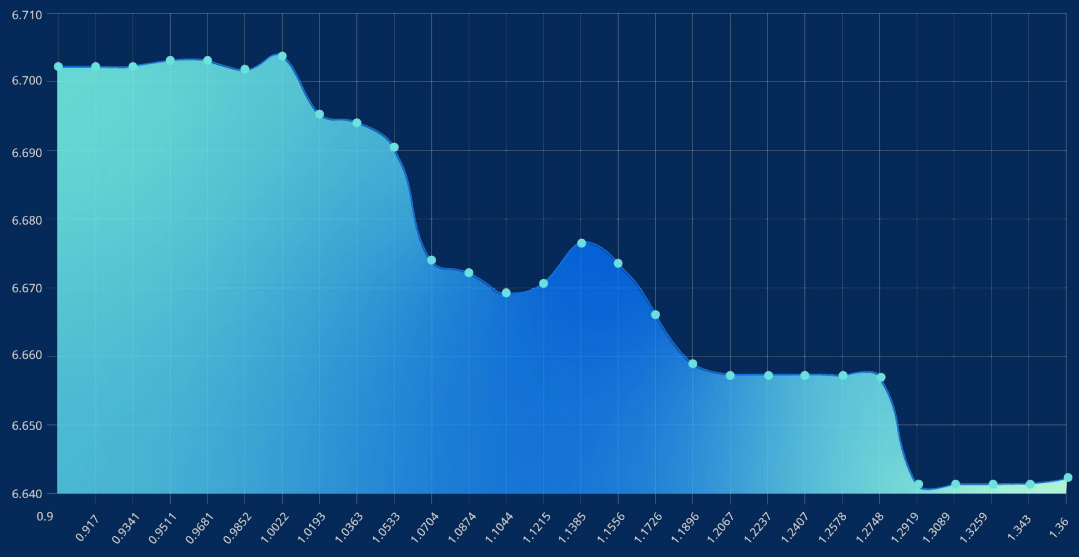
Potential business impact:

Optimize your feeding program, find out how the different ingredients and formulas interact with one another, and then apply to future flocks to save money on feed and boost performance. Evaluate raw material quality and composition by using AI; to then correlate diets to performance.

4.Obtain optimal placement density

Automated Machine Learning

What If Scenario:



If you want to discover how many birds you can place without negatively impacting on welfare or performance, data science can help. This graph is filtered to show one product.

By this chart, we know that if we are below about 1.02, we should expect a pretty good result. And that's when it starts to really decline from 1.02 onwards, we're just going to see a gradual downwards trend.

And so, we want to make sure we stay above the big dips, to get as many birds as possible for whatever weight we want. In this way, we can maximize the throughput.

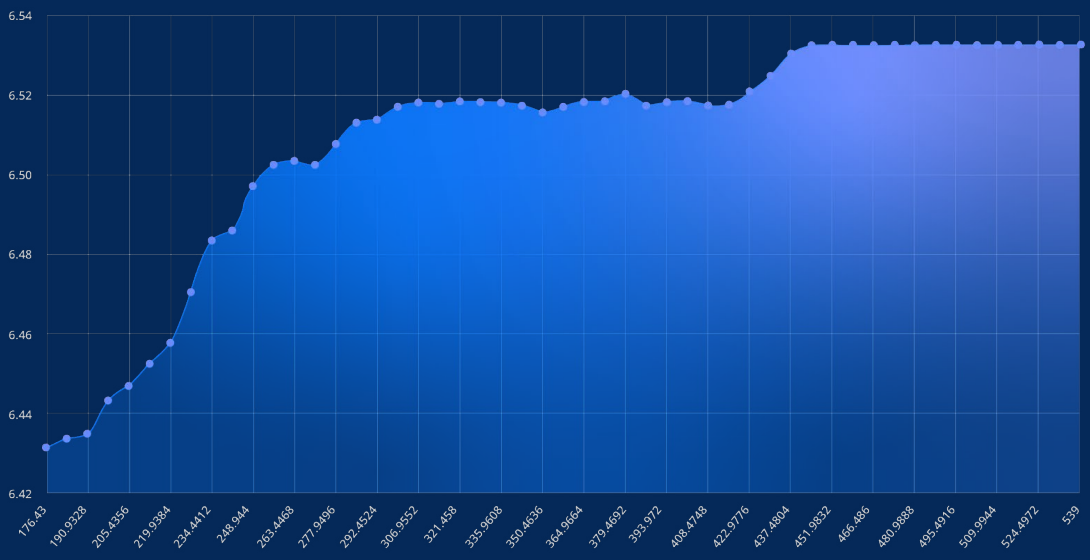
Potential business impact:

Enhance animal welfare resulting in increased performance, improve welfare compliance, saving you money at audit time

5. Uncover how genetic factors impact performance

Automated Machine Learning

What If Scenario:



This data science model is looking at historical data and using it to project how a flock will perform by parentage.

We could draw from it that if a flock came from a parent that was only 28 weeks old, it's not going to perform very well.

Whereas if it came from a prime parent flock age, it does considerably better. There are a few caveats to keep in mind for this data, this company was getting rid of its flocks after a certain period age. So, they always only had good parent ages. So, for this particular data chart maybe only trust this up until about age 56 weeks-57 weeks.

But the data presented here, will help to inform you at what age you should aim to deplete your breeder flocks to maximise broiler performance, and also show when young breeder flocks will achieve an acceptable chick weight for optimal broiler performance.

Potential business impact:

Determine flock potential, easily identify young breeder flock chicks for better placement, optimize planning initiatives by key performance metrics

6. Helps with disease detection and prevention to decrease mortality

Combined with data brought in from IoT sensors, data science analysis, and machine learning we can help producers take prescriptive actions where they are needed most-including animal welfare, disease prevention, and sustainability measures.

Having access to the right data at the right time allows can evidence-based decisions to be made in a timely manner.

"The implementation of data-driven decision support systems is important as humans will likely struggle to make optimal decisions when faced with the dynamic data that will be available.
With well-designed models, protective actions can be taken sooner in at-risk areas to prevent outbreaks."

Detecting and Predicting Emerging Disease in Poultry with the Implementation of New Technologies and Big Data: A Focus on Avian Influenza Virus

Potential business impact:

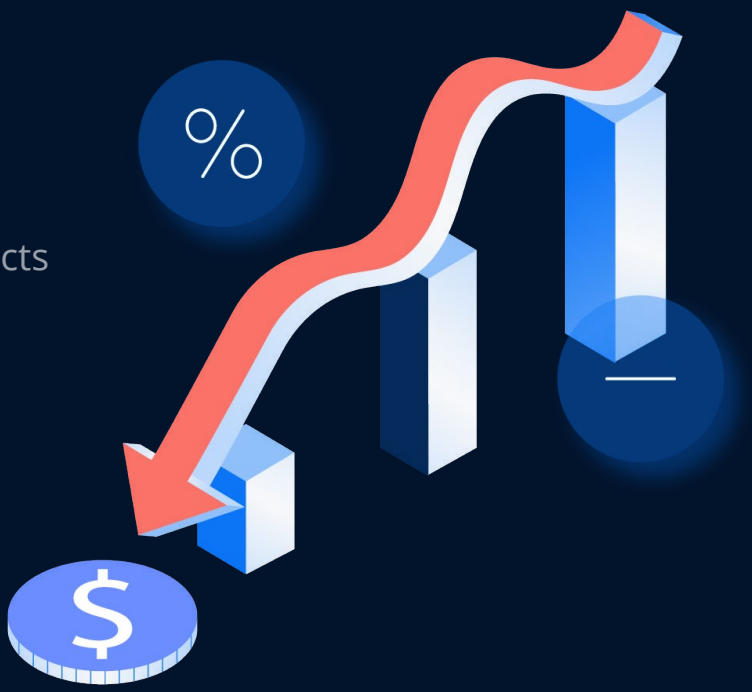
Predict outcomes of the flocks at placement, With IoT, we take prediction to the next level to perfect accuracy and see deviations far in advance to be sure you can stay within your predictive course.

Getting the fuller picture

Every business has different goals and KPI's that impact performance. The best part about data science is that it can be tailored to help with countless scenarios.

Many companies that want to start utilizing data science for better results struggle if they don't have the right resources.

Without the help of an expert or the right tools, it could mean making wrong decisions that impact your bottom line.



Check out our full suite of analytics products

mtech.software/solutions

MTech has over 30 years of experience...

Helping producers across the poultry supply chain to get the most out of their data and we have a full data science team. However, If you're not ready to hire a data consultant, our tools have analysis capabilities built-in that are designed to help our industry make the best decisions possible to grow their businesses.

Chat with a data consultant about your specific business challenges and goals:

Contact us to see your ROI potential