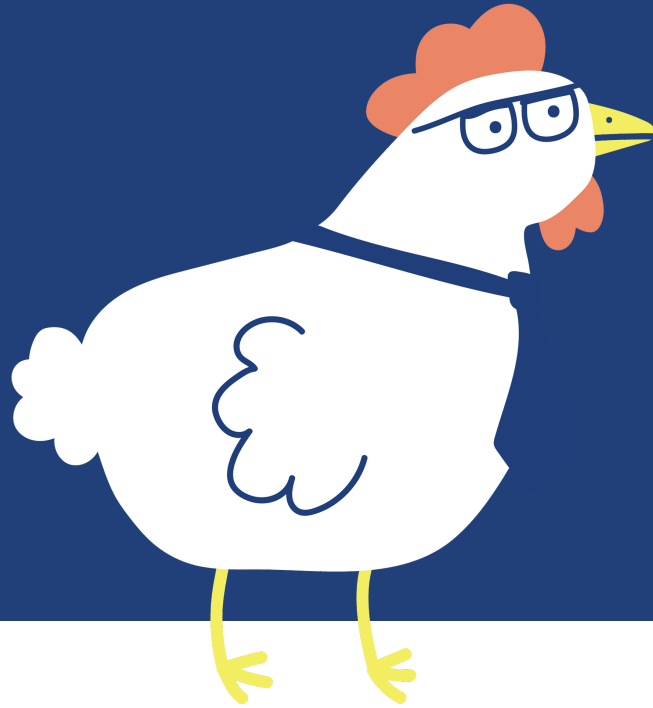


WHITE PAPER

PREDICTIVE POULTRY PRODUCTION MANAGEMENT

FINDING NEEDLES IN A HAYSTACK
BY CROSS REFERENCING
PRODUCTION DATA





“An ounce of prevention...”

Poultry farming has always been about knowing the condition of the flock: the absolute need to know exactly how the birds are doing, in order to detect any potential problem, as early as possible, and remedy the situation as quickly as possible.

It's called prevention. And it makes sense.

It involves a high level of awareness, of knowledge – and know-how – that, at the end of the day, makes the difference between success and failure.

This is why typical modern broiler houses are generally equipped with multiple devices that monitor and control important factors contributing to or affecting the growth of the flock.

“By constantly assessing data, the experienced grower can detect something unusual that prompt him to intervene to prevent a small incident from snowballing into a big (financial) problem.”

These devices assist the grower in managing his operation, first by providing him with crucial information such as level of feed, water consumption, temperature, humidity levels, bird weight and air quality and secondly, by allowing him to control and vary the factors that are affecting the living conditions of the flock to influence the outcome.

The idea behind this is that, by constantly assessing the information provided, the experienced grower may detect something unusual that will prompt him to intervene, if necessary, in order to prevent a small incident from snowballing into a big (financial) problem.

But what exactly is that "something unusual" that the grower should watch for and what should he do about it?

- It is a deviation

It is any information, observation or data coming to the grower's attention that signals a change from the expected chain of events under the conditions set up to be the most conducive to the best results possible.

It may not be a problem yet, but it could be at some point in the future. It is a clue that may need to be investigated.

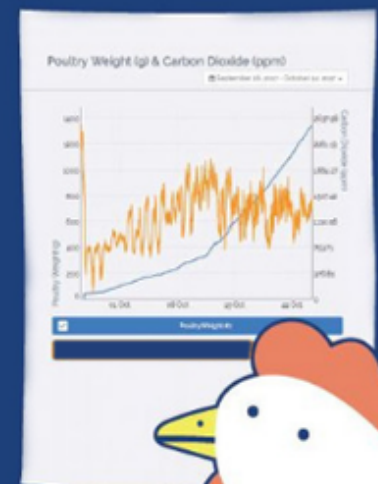
- It must act as a trigger

The awareness of the unusual data should trigger the start of an investigation process.

But the longer it takes between the

- a) occurrence of the change,
- b) the realisation of the change
- c) the finding of the cause and
- d) the action to remedy the cause, the more time the problem will have had to affect the performance of the flock.

Because anything unusual is something that can make the production deviate from its optimal course.



So the fresher the information is, the sooner the grower/integrator is alerted, and the sooner the problem can be addressed.

For instance, a sudden increase in water consumption may suggest a number of possible causes. It could have something to do with in-house temperature, it could be connected with feed composition, some kind of infection affecting the birds, or it could also just be a leak in the water system.

The increase in water consumption is not a problem in itself, but it is a clue that there may be a problem developing. It is a deviation from the expected chain of events and it needs to be investigated.

In this case, a quick check may do the trick. If it's just a leak, great! It's now repaired. Things go back on track.

But it is often not as simple as that.

Problem 1: An ever-shifting road to a predetermined destination

The reality is that each of the factors mentioned earlier are combining with each other all the time, constantly changing conditions, constantly steering the flock away from the optimal path.



What looked good early this morning may not be anymore.

Not only that, but even what may look normal now, may not be. Unless the information is cross-referenced in real-time with a change in another element that is happening simultaneously, the problem will go unnoticed; a situation which, if allowed to continue, could snowball into something more damaging.

Therefore, there can be no accurate diagnosis of a production situation unless the information coming from all sources is constantly refreshed so it can be read and understood in real time, as it happens.

Connecting all the dots is just part of the picture. The whole picture is actually a live performance developing each second of every hour of the complete growth cycle.

Problem 2: Comparing apples to oranges

Also, this “picture” can only be read and interpreted if the grower can understand the data provided to him.

That is, apple data and orange data have somehow been translated into similar dots that can be compared to each other, combined and cross-referenced. Only then will the grower be able to realize what is happening and take appropriate action.

Problem 3: The financial consequences

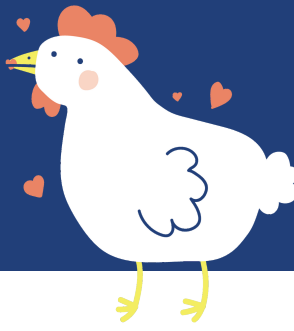
This is the result of problems 1 and 2. The difficulty in following a constantly changing map, combined with the difficulty of connecting seemingly unrelated data together is what makes the problem so dire and a possible solution so beneficial.

This White Paper aims at showing how preventive production management can increase production performance by allowing the cross referencing of multiple farming conditions factors through single platform solutions.

You will learn

- how cross-referencing data can get to the root cause of a problem earlier;
- how a single platform solution makes for easier diagnosis and implementation of best practices across an entire operation;
- how the combination of these tools enhances performance.





1. Time is of the essence of broiler production performance

Production targets having to be achieved at a specific point in time, the earlier any deviation from the optimal path can be detected and remedied, the more time there will remain for the flock's progress to get back on track.

That is why growers should keep an eye on everything.

- Investigating is time consuming

But because all the contributing factors are also combining with and affecting each other, it can take some real detective's work to identify the root cause of a problem, assess the possible consequences and find the appropriate solution.

All that work is taking time growers & integrators do not have to spare.

- And the clock continues ticking.

The longer this takes, the more astray the flock continues. The farther away it deviates, the more difficult it will be to steer it back on track and the greater the financial impact will be.

2. The growing environment: the potential, the pitfalls and the challenge.

Growers know that broilers do not perform to their genetic potential in a poor environment. That is why, instinctively, they tend to pay great attention to the production environment of their birds. And rightly so.

Although there is plenty of anecdotal information that confirms that kind of common wisdom, it can be quite eye opening to realize how actual results from scientific research analysis may complement traditional know-how with figures and formulae that make good performance easier to duplicate.

- Litter and air quality as an illustration of what can be achieved

For instance, it is now well established that litter quality – namely its composition and level of humidity – has a tremendous effect on the quality of the house environment.

"The wetter the litter, the more likely it will promote the proliferation of pathogenic bacteria and molds. Wet litter is also the primary cause of ammonia emissions, one of the most serious performance and environmental factors affecting broiler production today. Controlling litter moisture is the most important step in avoiding ammonia problems."

And "research has shown that if ammonia levels are allowed to reach and remain at 50 ppm or above, feed conversion can be increased by 8 points and final body weight decreased by 0.25 lbs." (Litter Quality and Broiler Performance, Casey W. Ritz, Brian D. Fairchild, and Michael P. Lacy Extension Poultry Scientists)

The same study suggests that, ideally, litter moisture should be maintained between 20 to 25 percent. It projects the substantial savings that can be achieved by proper litter management as it affects ammonia levels, parasites, condemnation rates and general bird quality.

Good air quality in livestock facilities can also have a significant impact on animal production performance and livability.

"In 2002, approximately 8.59 billion broilers were produced in the US by over 50 major broiler integrators (National Agricultural Statistics Service, USDA, 2003). The results of this study demonstrated that lowering ammonia exposure improved BW [Body Weight]. Thus, we can assert that managing the ammonia at or below 25 ppm resulted in a more consistent and uniform-sized product.

Lower variability in BW for mechanically processed broilers assists poultry companies in meeting emerging

standards for well-being as promoted by consumer groups because mechanical equipment can "treat" birds of similar size more reliably.

Controlling ammonia concentrations in 10% of the integrators and growers would translate into an exceptional production increase."

The potential:

- These illustrations indicate that close monitoring and fine tuning of the growing environment is indeed good practice.
- Not only does the practice allow for efficient prevention of problematic situations, but it also creates a basis for the continuous improvement of performance in the long run, with great financial impact.

The pitfalls:

- These illustrations also demonstrate how the growing environment is constantly changing as it is being affected by its elements combining with each other.
- For instance, a higher humidity level, taken on its own, cannot tell the whole story of what is happening with the flock. Nor are temperature, water consumption or weight readings taken days or even hours apart.





- And when ammonia levels are factored in, there is a real risk of not being able to come to the appropriate conclusion, with only one or some of the production environment data points which would lead to the wrong production decision. Its like playing poker without a full deck!

- Why? Because unless these readings - these dots of information - are made to be uniform and comparable enough in their value and readability, in order for the grower & integrator to connect them together and get a sense of the current situation and of its foreseeable developments, the dots never connect. The picture never materializes.

- The peril - and this is a situation that is happening as we speak - is that all the best practices that integrators may suggest, all the promises of all these great researches about optimal levels of all the elements making the growing environment remain just that: promises. Unfulfilled promises of better performance.

The challenge:

It is a balancing act. The grower has to constantly tune the balance of all the elements to create the optimal conditions needed at any given moment of the ever-shifting growing journey of his flock.

But for any balancing act to succeed, it is best performed on solid ground.

Fresh, readable, comparable information is a good start and makes for a solid foundation.

1. The right tools in the right hands

As technologically advanced as the poultry farm may have become, it still requires the know-how of experienced people:

- a) the growers who can read, cross reference and interpret the data to come up with optimal production decisions day in and day out;
- b) the integrators, enabling field supervisors to have a centralized overview of all the farms so they may support the growers in managing the flocks optimally to ensure expected results are obtained.

But it is a double-edged sword.

For all that human expertise to shine, it needs its own proper environment. Namely, the right tools to access the information conducive to the best production decisions. Without those tools - at the level of sophistication, complexity and scale of modern industrial broiler production - it simply cannot be done.

This may very well explain why a large proportion of the best practices, research-based guidelines and recommendations generated by or for the broilers' industry still cannot be successfully implemented.

There is still a technological gap between the on-paper promises of some of these best practices and their real-world possibility of actual implementation.

Until this gap is filled - that is until the growers have the tools to implement these performance-boosting guidelines - the hopes for better results may just be wishful thinking.

The good news is that the gap is not that wide. It can actually be filled by turning the following short list of must-haves into a reality.

What is needed to bring this to reality is:

a) Aggregated data available on a single platform

The needed information should be gathered from all sources and be accessible in a uniform language on one screen. This means that bird weight, humidity level, temperature, ammonia, water, feed consumption levels, etc., could all be looked at simultaneously, on one screen. Wherever the person accessing that information may be.

b) Real-time collection

The needed information should be collected, analysed and presented as it happens.

That means that the dots that the grower & integrator attempts to connect when they assess the situation would be the dots that represent the actual picture of the real situation that is developing at any given moment.

c) Variety of sources of information or sensors

The information should be gathered from numerous sources for reliability, accuracy and comparative purposes.

d) The solution should have a user-friendly interface to facilitate the cross analysis of the data

The data from all sources should be presented in such a way as to be easily compared or read in parallel with each other. That is how the grower would actually see things developing.

e) Predictive algorithms that allow users to anticipate what could happen

As the data is being collected on a continuous basis, so should its analysis be conducted, so patterns may be identified and possible outcome of current course of events, predicted.

This basically would tell the grower: the way things are currently going, this is what you may expect.

Based on this very useful information, the experienced grower might then decide to tweak a thing or two in order to put things back on track if the prediction made was not the outcome he wanted.

CONCLUSION

“A STITCH IN TIME SAVES NINE”.

Basically, what these words of wisdom are saying is that taking care of small problems immediately prevents them from becoming major issues.

We have seen how – given the right tools - this can be applied to optimizing the conditions of the broilers' growing environment and improving the bottom line of the production.

But it is not just a question of getting better at solving problems or even at preventing problems. This should be a given.

The real-time, single platform, predictive abilities of the above-described integrated solution would be designed to do all that:

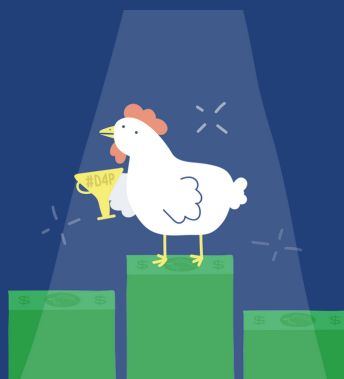
- Real-time would give the real story
- Single platform would make it easy to access the information
- A simple interface would make it easy to read the data and understand its meaning
- And the predictive capabilities would make the grower stay one step ahead of the flock, and the supervisors and integrators, one step ahead of the grower.

Such an integrated solution would have a tremendous motivating effect on growers and an empowerment effect on integrator's staff.

Given all the research-based guidelines and best practices available to them, growers would finally have the opportunity to put their hard-earned expertise to the better use possible.

To learn more about Preventive Production Management tools such as Compass, visit our website or contact your Intelia representative to schedule a demo.

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