Howard Dunne Memorial Lecture

Howard W. Dunne

Dr. Howard W. Dunne received his veterinary degree from Iowa State University in 1941. He was in engaged in private practice for one year and industry for four years before entering graduate school at Michigan State University. After receiving his PhD in 1951, he spent two years as deputy chief of veterinary microbiology at the Chemical Corps Biological Laboratories in Camp Detrick, MD. In 1953, he joined the faculty of Pennsylvania State University, where he headed the veterinary science research program and the large animal diagnostic laboratory. Dr. Dunne was internationally known for his work on swine diseases, particularly hog cholera and the swine reproductive viruses then referred to as the SMEDI syndrome. Dr. Dunne authored more than 90 scientific publications, and is perhaps best known for initiating and editing the textbook *Diseases of Swine*, which is still widely considered the “bible” of swine disease.

In 1971, the American Veterinary Medical Association presented Dr. Dunne with the XII International Veterinary Congress Prize to recognize his contributions to the international understanding of veterinary medicine. At the 1974 Congress of the International Pig Veterinary Society (IPVS), Dr. Dunne was elected president of the 1976 IPVS Congress, to be held in Ames, Iowa. His sudden death at the age of 61 in September of 1974 saddened the swine veterinary community, and the 1976 IPVS Congress was dedicated to his memory.

At the suggestion of Dr. Allen Leman, a financial gift made by the 1976 IPVS Congress organizers to the fledgling American Association of Swine Practitioners was combined with additional association funds to endow this prestigious annual lecture in remembrance and honor of Dr. Howard W. Dunne.

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People, processes and pigs: Are we fixing what is really broken?

James F. Lowe, DVM, MS

“Get r’ done” although great, it’s not a motto for long-term success

What a rough ride – two years of unadulterated pain – low prices, high feed costs, bad corn, disease, trade barriers, public policy challenges and a new virus that we got blamed for and had nothing to do with. Somehow in the middle of all this, in trying to help my producers survive, I’ve been asked to do things and make changes that I never thought I would deal with. I imagine many of you have felt the same. I have been asked more times that I care to remember: “Doc do we still need to do this?” Questions like that have made me think more than once: “Why are we doing that again?” As I looked back, the answer fell into one of three camps – things that were never right, things that we don’t need anymore and things where the “solution” looks right but the farm is still “broken.” Almost universally, when it “looks ok, but there is still a problem” implementation of the “solution” that I designed has not occurred. Needless to say, that has frustrated me, as I am sure it has you. Out of that frustration I have attempted to understand why “don’t we do what I thought we were going to do.” This paper is an attempt to explain my answer to the question: what can I do to improve the implementation of my “solutions” so they are more effective?

First I want to make sure we are all speaking the same language. As I talk with people about “implementation,” we invariably get confused because we are using different “languages” but saying the same thing. To avoid confusion, let’s start with a set of definitions. These may not be perfect but for the purposes of this paper we are going to use this “dialect”:

- **Task** is a series of actions to achieve a desired result. e.g. Injecting a pig is a task
- **Process** is a series of tasks that have to be completed in a specific order to create a change on the final product that is being produced. e.g. vaccinating pigs is a process
- **System** is a series of integrated processes that are conducted in a specific order to create a specific product or outcome. e.g. Raising pigs from weaning to market is a system.
- **Implementation** is defining the issue to be addressed within the context of the system, designing a process by developing a series of tasks in a logical order, teaching the process to the people that are doing each of the tasks necessary, monitoring the success and performance of the process and using monitoring data to correct errors by refining tasks or retraining people on the correct methods to conduct the tasks.

So it is all good, right? Simple as pie? Well, maybe not. Teaching someone how to implement, for me, is like trying to tell someone how to walk. I don’t know how I do it, I just get up out of the chair and get from here to there. Implementation is like that for many us, we “implement” every day but have no real idea how we got from here to there, it just happened. It is critical to remember that doing tasks is not implementing a process. Successful implementation is when a process repeatedly functions over and over again. As vets we tend to be really good doers and sometimes we mistake that for being good implementers. I believe that successful implementation in pork production is built on a foundation of four things: A complete understanding of the system that you are working in, a process that is biologically correct, processes that are simple enough to be repeatable, and the willingness and desire to identify and deal with the facts in an open and honest manner. There are certainly a few more details than that, but if any of these four basic concepts is not addressed it is impossible to have successful implementation.

Understanding that the system is not just sick pigs

As veterinarians we often fall into the trap of thinking about health programs in isolation, forgetting that they are one small, but important part of a much larger system. This happens for many reasons but human nature has us work on the things that we know best and are therefore the most comfortable with. As the health problem is being addressed, we get absorbed in all of
the details of the health issue and forget to include all of the nuances that the system has that make it successful. While I have spent a lot of time thinking and doing “system things,” it is still hard to make myself step back and take the big picture view of how everything fits together. Often we have a limited understanding of the biological, financial and human resource drivers of the businesses that we advise. Sure a pig farm is a pig farm, but System A and System B often have very big differences in how they measure success. Not understanding the small details of how the drivers of success fit together in a specific system can lead to poor process design and implementation failure as the changes that process imparts are either not real or, more commonly, not measured in given system. Each of us can work hard to increase our understanding of the biological, financial and human resource drivers of the business, which is why we attend meetings like this. But a large number of our implementation mistakes happen because we tend to defer to our clients’ assumptions about “production” things. As busy people, we often fail to invest the time to understand all of the details of the problem we are facing. This results in missed opportunities to challenge the thought processes of the system with FACTS and KNOWLEDGE to improve both the system and the success of our programs. I am not suggesting that we are better at production than clients. But if we want a true partnership, it requires that we have as much intellectually invested in their business as they do. We must understand the economic drivers of their business as well as they do.

A great example of inter-system differences is how they view the value of the breeding herd and a weaned pig. In manufacturing parlance, a breeding to weaning herd (BTW) is a sub-assembly routine, meaning that it is a cost center and not a profit center for the entire production chain. In a BTW herd, as in all sub-assembly routines, a great deal of profit can be destroyed, but none is created. If we think about the entire production chain, the single objective of the BTW herd is to produce a consistent supply of weaned pigs of the right genetics, age and disease status for the growing pig operation at the lowest cost. The correct number is based on the needs of the market, so that you adjust breeding herd inventory to account for changes in productivity. In addition, the genetic value of the growing pig must be weighted heavily in any decision about female breeding stock genetic selection. Ok, so that is common sense. Where are there inter-system differences? Businesses that sell weaned pigs have very different short term incentives than those that are farrow to finish and those that are truly integrated. Over the long-term, their key drivers are the same, however in the short run the BTW herd that sells pigs has very different drivers. The BTW herd is clearly incented to produce the most pigs possible, regardless of age or number per unit time, as this lowers cost and increases revenue by selling more units. This leads to the potential for over-farrowing and selection of genetics that promote maternal traits over terminal ones, as that produces more profit in the short run for the business.

If we step back, thinking on a more strategic level, many more inter-system differences become apparent. While there are many, many models of pork production that are successful, there are core principles that we need to keep in mind when thinking about improving systems. As a quick reminder of Econ 101 - The profit of the business can be defined as margin per unit multiplied by the number of units sold. Although it seems obvious, we need to remember that we are in a commodity business that will not, in general, pay for “added value” products. This has lead to the “cost, cost, cost” thought process in much of the industry today as we have control over cost, but not revenue, so the logical way to improve margin was to lower cost. A number of thoughtful pork businesses have understood that if one thinks about revenue first and designs a system around the cash flow needs of the business, a higher level of success can be achieved. This has resulted in systems that are designed around optimizing revenue and implementing processes to optimize margin and not just lower cost. This is a prime example of where understanding the business model drivers would lead to utilizing a different process to optimize profit based on the primary metrics that the system uses to measure its performance.

So how does that influence me implementing within a system? Remember the title of this paper is “People, Processes and Pigs: Are we fixing what is really broken?” Step one in that process is to understand what is truly broken. That must be defined within the context of the businesses goals and, more importantly, HOW THE SYSTEM MEASURES IF IT IS ACHIEVING THOSE GOALS. This is an invaluable insight into being successful in implementing anything. How the system measures success determines what they will define as being “broken.” In “system speak,” broken means that expectations have not been met. It does not tell you what process is broken, only that the system is not performing and needs further investigation. At that point only, when the business has defined that the system is broken, can we start to work on problems. Does that mean that we have no role in defining the problem? – no. But it does mean that we need to make
sure we are defining the problem within the context of the system’s measurement tools.

As an example of solving the “real” problem compared to “our” problem is enzootic pneumonia. As a profession we have promoted that a M. hyponeumoniae (Mhp) “negative” herd is the best option. Is it really? Notice I defined the problem as enzootic pneumonia and not Mhp status. In my experience, pigs without enzootic pneumonia are what the system really wants. If they are Mhp negative, that is great, but it is not what matters to the system. In every case the system values a predictable result. This is intuitive right? Things that are predictable are easier to deal with. Now maybe Mhp negative is more predictable and that is the best bet for the system, but what if it is not? We must understand that pig health stability at weaning is the biggest thing that we do to improve system performance. More stable is more predictable and that is easier to work with. Notice that I did not say “high health pigs,” or “disease free pigs” or “triple negative pigs.” I used the term health stability. Pigs with a consistent level of ALL potential pathogens are really valuable as they promote a consistent and therefore a predictable process. That suggests to me that we have to define our health improvement goals differently than we have in the past if we want to be successful in today’s industry.

The health goal that I work on is controlling the rate of pathogen transmission in the breeding herd. This is opposed to producing pigs negative for disease x or y. Now please understand, I am not promoting that consistently sending PRRSv infected pigs to the weaning to market (WTM) system is acceptable, but by the same token I am saying that “tested” negative sow herds for some diseases may not be ideal either. Back to our Mhp example, “negative” breeding herds that are at risk of infection may cost more to the system over a five year period than “controlled positive” herds with an immune population. Mhp outbreaks have a really high cost in both disease and the lack of predictability for the system. Our ability to understand, measure and manage the basic disease transmission model (Susceptible, Infected and Resistant model) for pathogens in the sow herd will greatly improve our chances of success in managing disease in the down-stream pig flow. With that comes a need to be willing to promote and help implement basic disease control practices, including isolation, acclimation, limited sourcing, and herd closure. Vaccine, while it has a place in assisting in health programs cannot be our first line of defense in stabilizing the health of breeding herds.

This is where the separation between “doing” and “implementing” comes up. As doers we are ready to put an additional vaccine in, or change its timing, or make a change in treatment protocol, when we see a problem. Implementing means that we have to step back, measure what our current processes are doing, understand if change impacts the system and how the system will measure that change. If we can explain the problem in those terms, then we have a much greater chance of impacting how the system behaves and designing processes that are consistent with the goals of the system.

Not all processes are created equal

Even when we understand what the system needs our work is not done. Processes that are successful, meaning they improve the system’s performance, are repeatable over time. That means that in pork production, process design must be consistent with the underling biology that drives the production system. I realize that statement is intuitive, but there are many times that I have failed to design a process that matches the biology of the pigs. Worse, every time I have built a process that missed a biological fact, some doubt was created about my ability to solve problems. This has only intensified over time as my producers became more sophisticated and in many cases understood the biology of growth or reproduction better than I did. Unfortunately, there are many practices that I see proposed, some even in the literature, that are missing a key biological fact and many times boarder on witchcraft. As the principles (or lack of them) on which the practice is based, fall so outside the bounds of nature that the practice has no hope of long term success. PRRSv seems to have brought out the worst in our nature as “doers.” Maybe the best example is the promotion of a killed encephalomycocarditis virus vaccine to protect herds against “mystery swine disease.” While I too have the desire to help a client, that desire must be balanced with a thorough understanding of the biology and a willingness to admit that we may not have the solution today. I have fallen into the trap of justifying a biologically implausible process with “data.” I put that term in quotes because both the term and numbers used to represent “data” are so abused to justify an argument that they have almost become meaningless.

To create a successful process, we need information that has been collected in a robust scientific manner. Access to this type of information is one of the greatest challenges that our profession faces. We promote science based medicine, but our access to information from large scale, blinded, placebo controlled, and independently funded field trials is sorely lacking. This leaves us with a series of small trials which are incapable of controlling for many confounders. These confounders create a risky situation when we extrapolate data to our
individual problems. Many say this is better than nothing; I disagree. In many cases confounders are misinterpreted and when we apply similar methods, in another situation, we have wildly different results. Having access to well controlled, blinded, clinical trials like our human, medical colleagues, would do more to promote better medicine, and improve the implementation of our processes, than any other single item. Our challenge is finding the resources to conduct these types of trials.

It’s a pig farm, not a rocket ship
This implementation thing is not so hard – “know thy system and stick to the facts.” Well… this is often where the train runs off the tracks. All of us are trained to be technically proficient; that is how we got through vet school. We are the masters of the small, perfecting our ability to regurgitate the smallest detail in the proper order. So what have I done in the name of technical perfection? I create solutions that are 10 times more complicated than they need to be. Although these highly complicated processes make sense to our technically trained minds, they are difficult to implement and almost impossible monitor. Somewhere along the line, I was told that the best solutions are often the most elegant; simple and easy for everyone to understand. Our solutions often are detailed, multi-step, and technically demanding. We perceive that adding complexity must make it better, or make us look smarter, or make us better than the other guy that was just here and was unable to fix the problem. Having the courage to step back and assess what is really going on, has taught me many things. Often I just assume that the process is broken and I start making changes. The first step in being successful is answering the question: “Did we do what we said we were going to do.” More likely than not, we are not doing what we thought we were doing. It is not necessarily that the first process was wrong and needs to be “fixed,” but that the first process was never fully implemented. The solution is to understand why we are off track.

As an example, I cannot count the number of times I have been asked to fix a neonatal diarrhea problem? Same old drill right? Diagnostics, make some vaccine or antibiotic change, and the problem is “fixed.” After about three rounds of that on the same farm, you have the poor team doing 27 tasks in the first three days to fix the diarrhea, and the pigs are still scouring, and the people are tired and frustrated. Having worn myself out with lots of effort and lots of details, I would challenge each of us that making a recommendation to treat every pig with an antibiotic to “fix” neonatal diarrhea is malpractice, if we do not couple it with other changes. Ok, I know that seems a bit extreme, but if you step back and look, it is not as radical as it sounds.

Neonatal diarrhea, like all disease, is a function of exposure compared to immunity. In this case the immunity is maternally derived so a simple algorithm (figure 1) can be used to determine the root cause of the diarrhea. In summary, there are four primary causes: poor colostrum uptake, poor quality colostrum, poor between group hygiene and high level of dam shedding. When I look critically at farms with diarrhea, often there are problems in all four areas that are due to lack of implementation and not lack of a bottle (vaccine or drug). It is management, not medicine that we need to focus on in almost every case. By the way, I forgot one definition. Management is the process of making sure that tasks are done properly and in the right order so that processes work. This is in contrast to what many people think when they hear the term management; creating new tasks or reordering tasks to modify a process. This is not management, it is system design. This is really an important distinction.

People, yes the people
Those of you that know me will be shocked with the next statement. I can get frustrated with “staff” that “do not do what we asked them to do.” While not admitting guilt, in a case or two I may have blamed them for failures, when in reality, I failed to lead them. I know no one else has ever done this, but just in case they have, I would like to share a few thoughts on what I have learned at the process-people interface. I firmly believe that people get up every morning and want to do a good job. Receiving the emotional rewards of having someone know that they did it right TODAY is a powerful motivator. Unfortunately, there are many days when people do not do a good job. Why does this happen? First and foremost, doing it right is ALWAYS hard. If we spend the time to remind and coach people on the right way to accomplish what we want, then our chances of success are exponentially increased. Without this constant feedback, human nature will lead people to find an easier way, that does not fulfill the long-term objectives of the process, and failure will eventually occur.

Secondly, as a leader we will do almost anything to avoid conflict, no matter how small that conflict is. This creates a situation where someone is not doing it right and we ignore it, which reinforces that doing it wrong is OK. Adding to our basic tendency for conflict avoidance, there is societal pressure to avoid discussions about negative facts. As one who seems to struggle
less with talking about what went wrong than others, this perceived societal norm makes you look like a jerk. Now, I can be a jerk with the best of them and may have at one time in the past gotten in someone’s grill about something that I thought was broken. But I am not talking about my fits of frustration and futility; I am referring to the “we only want to talk about the things that went right” culture that exists today. When I checked the program for this meeting I did not see any papers that started with “I really screwed this up.” At its worst I call it the “everybody gets a blue ribbon” syndrome.

To be an effective leader, we must deal with the facts in an open and honest way to drive improvement and implementation of processes. Working to our advantage is human nature; people want to know where they stand every day, good or bad. Security in one’s job standing is one of the best things that can happen to increase productivity in the work place. Sure people love to know that they are doing a good job and are appreciated by their leaders, but more importantly, if they have not met expectations, how do they correct what is wrong and get better? We live in the land of second chances, giving people the opportunity to correct mistakes. More importantly, to be ACKNOWLEDGED for correcting those mistakes is one of the most powerful motivators that I know. The challenge for all of us is that feedback cannot just occur during the formal review processes. It must be delivered in real time. I often think that I am so busy, that there is not time to stop and reinforce the good and correct the bad. This makes me much less successful as a leader than I might otherwise be. Finally, and most importantly, we must live in the here and now. What happened yesterday, good or bad is not important – it cannot be changed. Only today and tomorrow are important, for we can change what we are doing now and what we will do in the future. We often fall into the trap of rewarding people for what they have done in the past, and not for what they are doing today, while getting down on others, failing to see their improvement over time and recognize a job well done today.

As vets we sometimes fail to communicate our ideas in a manner that promotes the success of our recommendations. We are wired differently than many
of the production people that we work with. In general, as vets we seek to understand and explain the “WHY” of a change or why a system works. It is part of our training – we can’t fix a problem if we don’t understand why. Production staff’s, and in the case of all barn staff, job is to DO the process. While production staff may want to know why, they have to understand WHAT to do and HOW to do it if they are going to be successful. I cannot count the number of times have I talked to a producer and explained WHY we are doing something in great detail and completely left out the HOW to do it? If we cannot fill in all the gaps, explain WHAT and then teach HOW we want it done, we have little hope for successful implementation of the processes that we recommended.

Bow, big or little you still need a bow

So where does that leave us? Well if nothing else this is why they call it practice and not science! What I have tried to share here is that successfully getting things done can be systematically approached though the application of four key principles. First, to be successful, we must understand the business by understanding the key drivers of profit and how improvements in the system are measured. This is not a casual understanding but a deep and thoughtful approach to understanding the nuances of the economic model and how it can be used to optimize profit. Secondly, we must take time to understand the biology of the problems that we are dealing with and design solutions that are based on our best understanding of the biology. We should be able to explain, to ourselves, how the processes that we design work biologically and why our proposed solution is the best biological solution for the problem. To that end, we need to utilize the best evidence available, while being careful in our extrapolation of data between systems. We must make sure that we have identified and understand all the potential confounders in a data set before we use it in a different situation. Third, we have to make our solutions simple enough that they can be implemented over and over and over; leaving unnecessary steps out, for a truly elegant solution. Finally we MUST BE LEADERS! This means that we have to focus and commit the time to work with the people that we are asking to implement the processes that we design. Paying special attention to the details of HOW to do WHAT we asked. At the same time making sure we are following up to review progress and provide the immediate and constructive feedback that people need to achieve their best.