

MPPA Pork Quality Taste Test Results

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Many producers had the opportunity to participate in a series of pork taste tests at the recently held Michigan Pork Producers regional meetings. This meat quality educational initiative was designed to both inform and sensitize pork producers regarding the prepared quality of their ultimate product and to compliment the presentations on consumer and production issues that followed. The pooled evaluations of the four meetings and 154 participants have been compiled with some interesting results. As a part of these demonstrations, participants were asked to evaluate five prepared meat samples in each of four categories. Tenderness, juiciness and flavor were scored on a scale of 1-10, 10 being most ideal, and overall acceptability was reported by the participants.

The meat samples tested varied by quality category, preparation and in one case, specie of origin. Sample one, was a fresh pork sample representing the DFD (Dark, Firm and Dry) category. This quality classification is characterized by pork with a high ultimate pH and a dark, dry precooked appearance. Sample two, represented what we consider ideal pork quality or RFN (Reddish-Pink, Firm and Non-exudative). Sample three, was a PSE (Pale, Soft and Exudative) sample. This classification is typically low in ultimate pH and has very little intra-muscular fat. Sample four, was fresh turkey breast. Sample five, (RFN/O) was similar in RFN appearance to sample 2, but was overcooked to an internal temperature planned to easily exceed 180 degrees. Each of the other samples was prepared to a medium degree of doneness (approximately 160 degrees). All of the pork samples were of loin tissue (Longissimus Dorsi) and were purchased from local retail stores.

Tenderness scores are shown in Table 1. DFD, RFN, and Turkey were statistically similar but were superior in tenderness to PSE and RFN/O product. This is consistent with expectations and prior research. This is also very important because consumer research on preferences for meat characteristics, show that tenderness is the number one area that effects acceptability of

product.

In the juiciness category also depicted in Table 1, RFN average scores were similar to DFD, but superior to PSE. Interestingly though when compared to Turkey, and RFN/O, scores for RFN, DFD and PSE were also similar and higher. Turkey and RFN/O samples had the lowest scores for juiciness and were not statistically different.

Flavor scores were more difficult to evaluate perhaps because of differences in regional performances or product variation. The largest inconsistencies were scores for Turkey and RFN/O samples, ranking from very high in some tests to obviously last in others. Some trends observed in Table 2 show RFN scoring slightly higher than DFD samples and PSE product being consistently in the lower half of the rankings.

When participants were asked to rate samples as either acceptable or unacceptable, great variation by meeting was also evident (table 3). The acceptability of Turkey, PSE and RFN/O product was particularly variable, with more consistency for the RFN and DFD samples. If however you pool the average scores, the two most acceptable samples were easily the RFN and DFD as expected. One disturbing fact was the nearly 10% rate of unacceptable ratings for the "best" pork quality product, from the "best" pork cut, prepared in the "best" manner. When you include incorrect preparation and the degree of meat quality variation available for consumer purchase, it paints a clear picture of future challenges and opportunities. Certainly, it is the responsibility of all involved in this industry to strive for a more consistent, high quality, wholesome, consumer preferred pork food product and thus earn the title "The Meat of Choice".



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MPPA Pork Quality Taste Test Tables

Fig. 1. Tenderness and Juiciness

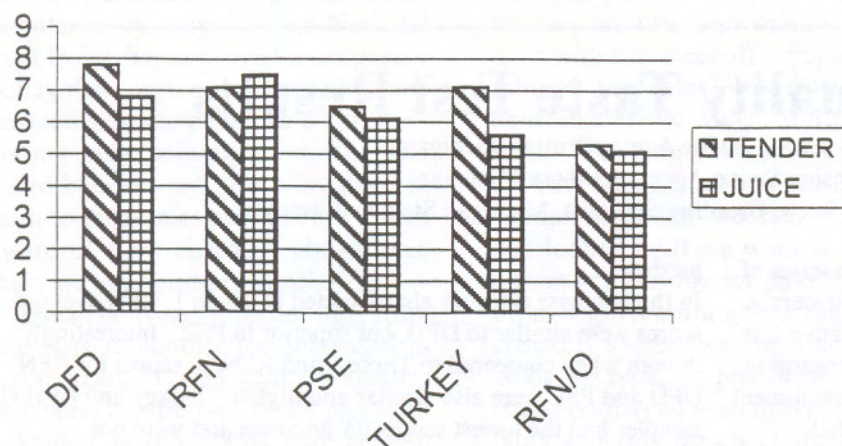


Fig. 2 Flavor Scores By Region

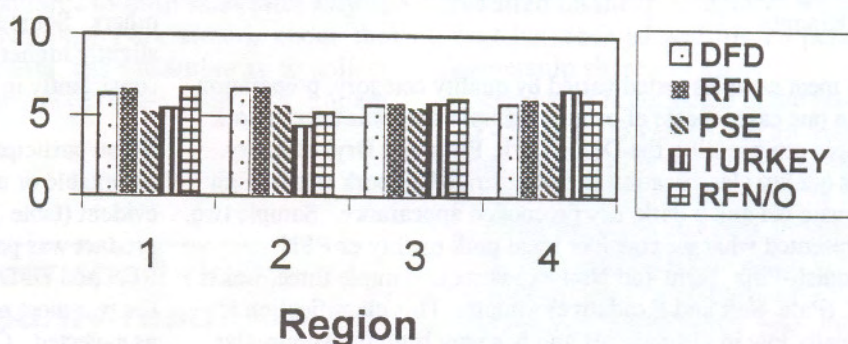
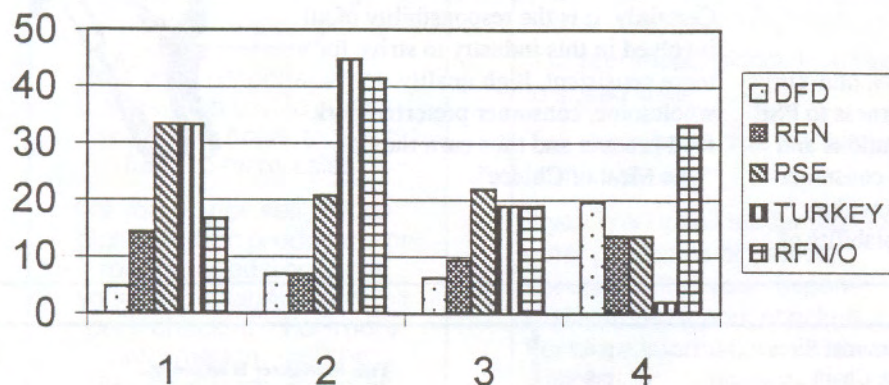


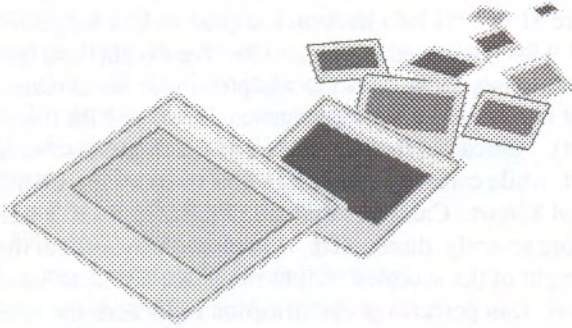
Fig. 3. Percent Unacceptable By Region



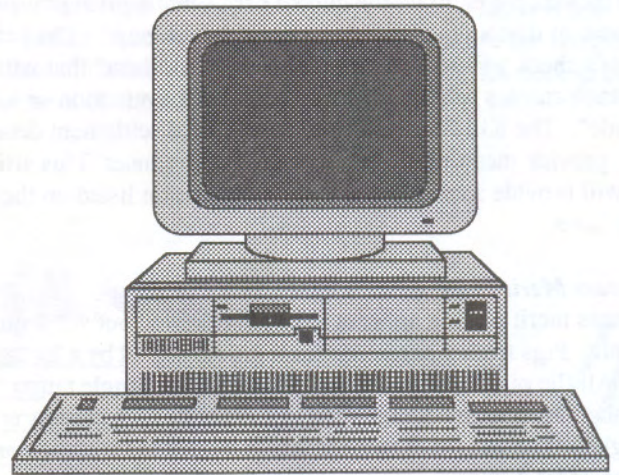
Late Breaking News

PigCHAMP Software Update

PigCHAMP users will be interested to learn that unless they are currently operating with PigCHAMP version 4.0, their swine records program will cease to run properly in the new millennium. Recent rumors led to a call to the PigCHAMP offices in Minnesota to confirm the status of older versions of the PigCHAMP program. If you are currently running PigCHAMP version 2.0 or 3.0, your program will no longer operate after January 1, 2000. You will need to upgrade to the latest version, 4.0. The good news is that if you have faithfully paid for a maintenance agreement, you can upgrade for a mere \$450. If you have allowed your maintenance agreement to lapse, the cost of the upgrade will be \$900. This is only if you are currently on version 3.0. Those of you on the older 2.0 version will have to pay the entire cost of the new program, approximately \$1200.



The good news is that those of you with older DOS computers, the new version will run on those machines. If you have upgraded your technology to something that will run Windows, you may be interested in other record keeping options that are available. If you are interested in the "other" options to PigCHAMP, please contact Tim Johnson at (616) 846-8250 for a list of other swine software packages.



Spartan Classic - Prospect Pig & Market Hog Show

The second annual Spartan Classic Hog Show will be held on Saturday, June 20, 1998 at the MSU Pavilion. Entry deadline is June 5, with no late entries accepted. The entry fee is \$10 per animal. All animals must have a health paper and PRV certification. Animals weighing up to 220 pounds will be shown as prospect pigs, animals over 220 will be shown as market animals. Animals will be weighed and scanned upon arrival.

For more information please contact Al Snedegar at (517) 355-7485 or Dale Brown at (517) 639-4202. For entry forms and rule information contact the MSU Department of Animal Science (517) 353-4893.

This contest is a great way for youth to sharpen their showmanship skills before the summer fair season and to learn about improving their abilities and knowledge of the swine industry.



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Kill Sheet Lingo

by Ronald O. Bates, Swine Breeding Specialist
Animal Science Dept., Michigan State University

Introduction

On April 6, 1998 Thorn Apple Valley began 100% carcass merit procurement. This has caused a switch for many producers who have been selling on a "live weight" basis. Pork producers who had been selling on a live weight basis will now be quoted a base carcass weight price and possibly a comparable live weight price. The final payment check to the producer will include payment on the quoted base carcass price plus premiums or discounts due to carcass merit and "sort". The producer's check will be accompanied by a "Kill Sheet" that will list each carcass sold and their carcass merit evaluation or "grade". The Kill Sheet will outline the final settlement details and provide meaningful data back to the producer. This article will provide some insight to the information listed on the Kill Sheet.

Carcass Merit Pricing

Carcass merit pricing appears to be complicated but yet is quite simple. Pigs from a particular farm are identified by a lot tattoo. All the pigs for a particular lot are given a single tattoo number. As pigs are slaughtered in the plant, each carcass is weighed. The weight of that carcass is totaled for a particular tattoo or lot number. Immediately before the carcass is weighed, the carcass is measured for backfat thickness and loin muscle depth. Percent lean is calculated from the backfat and loin depth measurements. The backfat, loin depth, percent lean and weight for a particular carcass remain together within the data system. When all pigs from a particular lot have been weighed, the lot weight is then multiplied by the base carcass weight price. For example, Producer A sells 100 pigs and the carcass weight totals 17,130 lbs. The carcass weight of 17,130 lbs is multiplied by the base carcass weight price (e.g. \$45.50/cwt). The base payment, before premiums and discounts, to the producer is \$7,794.15.

Lean Premium

Each carcass is graded for lean percent and compared to a standard or base. The base lean percent at Thorn Apple Valley is 48.0%. For carcasses that are higher than 48.0% the producer receives a premium while those that are less than 48.0% the producer receives a discount. The lean premium at Thorn Apple Valley for carcasses that grade 48 to 54% lean, is 1.5% of base carcass weight price for each lean percentage point above 48%. For example, a 52% lean carcass weighs 171 lbs and the base carcass weight price is \$45.50/cwt. The carcass was graded 4 percentage points above the base of 48%. The lean premium is 6% ($4 \times 1.5\% = 6\%$) of the base carcass weight price or \$2.73/cwt. ($\$45.50 \times 0.06 = \$2.73/\text{cwt}$). The total lean premium for the carcass is \$4.67 ($\$2.73/\text{cwt} \times 1.71 \text{ cwt} = \4.67). The lean premium for carcasses that grade 55% lean is 10.25% of base carcass weight price, while carcasses that grade 56% and higher have a lean premium of 11.25% of base

carcass weight price. It is important to note that the lean premium does not increase for carcasses that grade higher than 56%. This is due to greater processing difficulties for extremely lean hogs as well as a tendency for these carcasses to have poorer pork quality. The discount rate works in the same manner except that the discount rate is 2% for lean percentage point change from 45 to 40%. Carcasses under 40% lean are discounted more heavily. Carcass premiums and discounts are tallied and added to the base carcass price paid to the producer.

Sort

The term "sort" has become synonymous with carcass weights that are either above or below the accepted range. The Thorn Apple Valley standards for carcass weight are different for carcasses of different lean percent. For carcasses that are 51% lean or below, the accepted carcass weight range is 164 to 196.9 lbs (estimated 220 to 264 lbs live weight). Carcasses that are 51 to 52% lean have an accepted weight range of 164 to 203.9 lbs (estimated 220 to 270 lbs live weight) and for those carcasses above 52% the accepted range for carcass weight is 164 to 211.9 lbs (estimated 220 to 284 lbs live weight). Carcasses that weigh 161 to 163.9 are discounted \$1/cwt, while carcasses that weigh 157 to 160.9 lbs are discounted \$2/cwt. Carcasses under 157 lbs (210 lbs live weight) are more severely discounted. Carcasses heavier than the upper weight of the accepted weight range are also discounted; however, lean percentage classification influences the rate of discount. Carcasses that grade 51% lean or less and weigh 197 to 203.9 lbs are discounted \$1.75/cwt while carcasses that weigh 204 to 211.9 lbs are discounted \$3/cwt. Carcasses that grade 51 to 52% lean and weigh 204 to 211.9 lbs are discounted \$1.35/cwt while carcasses that weigh 212 to 218.9 lbs are discounted \$2.70/cwt. Leaner carcasses, those greater than 52%, are discounted \$1.35 from 212 to 218.9 lbs while those weighing 219 to 226.9 lbs are discounted \$2.70/cwt. To further understand the range in weight discounts contact, your Michigan Livestock Exchange buyer or Thorn Apple Valley.

Yield

The term yield or dressing percent is a simple one that is over used and abused in carcass merit programs. Yield is nothing more than a division of carcass weight by live weight. For instance if a pig weighs 250 lbs alive and the carcass after slaughter weighs 185 lbs the yield is 74% ($(185/250) \times 100$). However, there is great turmoil in the industry over yield. Some of it is relevant but most of it is not. Packers do weigh the entire lot and weigh each individual carcass. Yield is calculated by dividing the total carcass weight by the total live weight. This gives a good estimation of the average yield of a lot, but does not accurately reflect what an individual carcass yield within a lot may be. It is typical for yield within a lot to be plus or minus 3.9% from the average. For instance if the

average yield was 74% it would be expected that the range for individual carcass yields would be 70.1 to 77.9% for 95% of the carcasses.

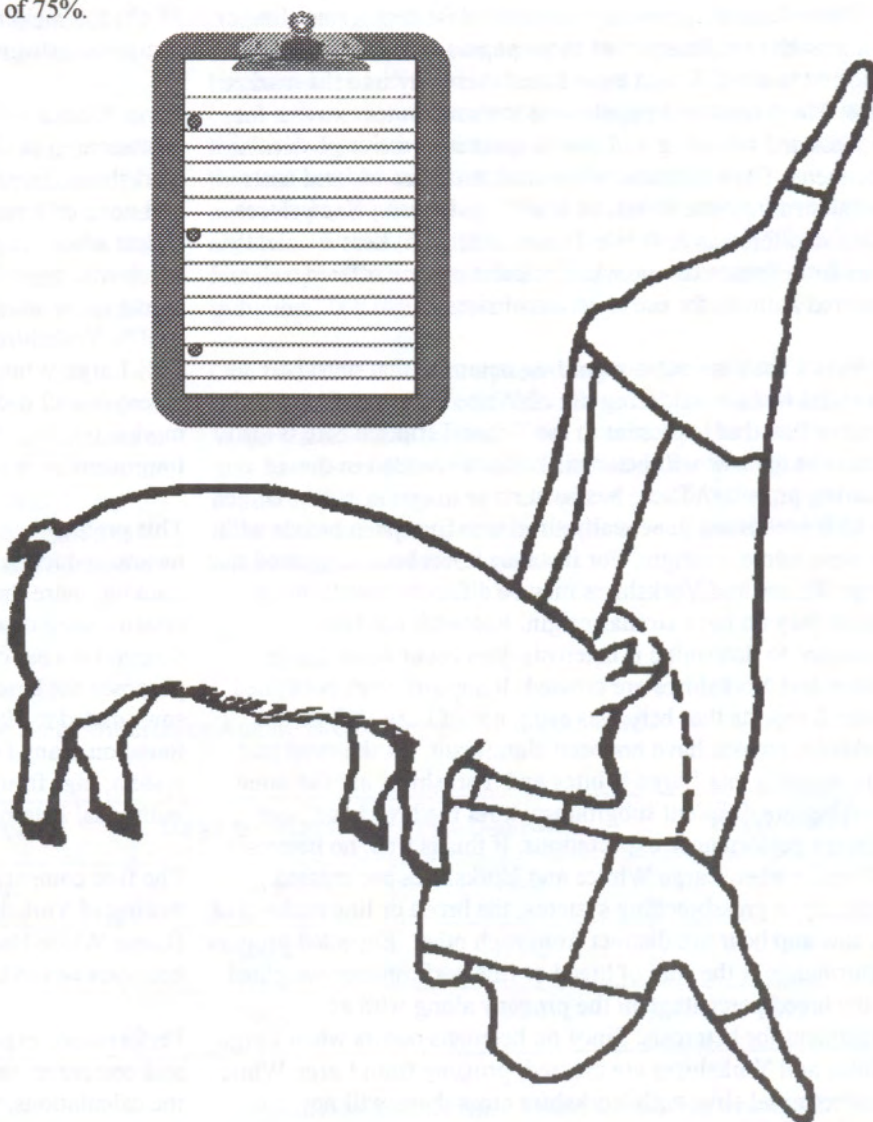
Most anxiety occurs around two areas of concern. The first is the difference between the expected yield and actual yield while the second deals with the concept of "yield premiums". The first point addresses expectations versus actual outcomes. Typically what happens is that a producer has an average live weight of a load and may also have some idea of what the range in live weight was. After the pigs are slaughtered some carcasses are discounted due to "sort". The producer becomes concerned because his calculation of yield, using either the average live weight or the "known" range in weights with the average yield, does not match the carcass weight range (and therefore discounts) that were detected through the slaughter process. However, there are a couple of things that could have occurred to cause the range in carcass weights reported by the packer. For example a producer puts a couple of 220 lb pigs on the truck, thinking that they should not get discounted. Past kill sheets have reported an average yield of 75%.

Thus a 220 lb pigs with a 75% yield should have a 165 lb carcass. However, the producer is discounted for selling a carcass that weighed 158 lbs. The individual carcass yield can vary 3.9% from average for an individual carcass and still be considered normal. Therefore if the 158 lb carcass matched the 220 lb pig the yield would be 71.8%, which falls within the 3.9% range. Some factors that can contribute to the variation in carcass yield are; timing of weighing, fill, dehydration, and trim loss. The carcass is weighed after it has been inspected. When a carcass is trimmed the carcass weight is less than expected. If carcasses within a lot have been trimmed it is noted on the kill sheet summary.

The second point, "yield premiums" is a fallacy within the industry. At this time, Thorn Apple Valley does not report a "yield premium" but some packers do. However, it is important to always remember that packers pay for carcass weight not the conversion of live weight to carcass weight. Packers do not pay premiums for yield on carcass merit programs. During pricing, a carcass weight price is set, for example, \$45.50/cwt. Buyers some time take the carcass weight price and multiply it by the plant's average yield (e.g. 74.5%) to come up with an equivalent "live weight price" ($\$45.50 \times .745 = \33.89 which may be

rounded to \$33.50 or \$34). Upon selling pigs to the packer, the carcass weight is priced at \$45.50/cwt. However, if the actual yield is higher or lower than the plant average, the math is completed to demonstrate how the "live weight price" received is different than what was quoted. However, packers pay for carcass weight not the conversion of live weight to carcass weight. The carcass price never changes. Further premiums or discounts paid to the producer are based on lean premiums and "sort", not on yield.

With a switch to 100% carcass merit buying, pork producers will have the ability to track their lot to lot differences which can provide them seasonal and yearly trends. This will provide further management information to improve the competitiveness of their business as well as better position pork to be, "The meat of choice".



White Terminal Sires ???

by Ronald O. Bates, Swine Breeding Specialist
Animal Science Dept., Michigan State University

The changes that have occurred within breeding systems across the industry have caused an on-going search for different genetic types for usage as terminal sires. Different breeds, lines and their crosses have been tried with varying degrees of documentation to prove their worth.

Among the many types of terminal sires has been the introduction of A White Terminal Sires[®]. At first, this may seem as an oxymoron. Most pork producers may assume that white breeds and lines have been selected primarily for maternal characteristics and may not be superior for postweaning performance. However, there exists throughout the world populations of both Large White and Landrace (as well as synthetic lines with Large White or Landrace ancestry) that have been selected primarily for reduced fat depth, muscling or lean growth rate. Samples of those populations have been imported to the U.S. and have found their way into the market place. These imported populations are sometimes extreme for leanness and muscling and can be quite impressive physical specimens. These extreme white lines are often crossed with typical terminal sire breeds or lines (e.g. Durocs, Hampshires, etc). and offered as A White Terminal Sires[®]. Less frequently, boars from these extreme white populations are offered as purebred animals for use as terminal sires.

There is a basic question regarding heterosis that must be answered when considering use of White Terminal Sires. If the breed or line that is present in the White Terminal Sire is also present in the sow will heterosis be compromised in the resulting progeny? There has been some question as to whether the U.S. breeds are genetically similar to European breeds with the same name or origin. For instance it has been suggested that Large Whites and Yorkshires may be different breeds, even though they do have similar origin. Research has been conducted to determine if heterosis does occur when Large Whites and Yorkshires are crossed. It appears from published research reports that heterosis estimates of Large White and Yorkshire crosses have not been significant, for the most part. This suggests that Large Whites and Yorkshires are the same breed but are different subgroups within the breed and have different performance expectations. If this is true, no heterosis will occur when Large Whites and Yorkshires are crossed. Typically in crossbreeding systems, the breed or line makeup of the sow and boar are distinct from each other. Expected progeny performance is the sum of breed or line performance weighted by the breed percentage in the progeny along with an adjustment for heterosis. Since no heterosis occurs when Large Whites and Yorkshires are crossed, progeny from Large White cross terminal sires with Yorkshire cross dams will not experience the complete benefit of heterosis.

The challenge regarding this issue is to understand if the loss of heterosis may be overcome by superior performance of an extreme population of like ancestry. In an effort to solve this question, performance expectations were developed from published research reports for Yorkshire, Landrace, Large White and the Hampshire breeds. The Yorkshire breed was chosen as a standard reference and its performance expectations were given a relative value of 100. Percentage comparisons were then calculated for each of the other three breeds (Table 1).

From research reports, Large Whites have been reported to reach market weight 3.2% faster, be 11.4% leaner with feed/gain 4.1% better than Yorkshires. Thus in Table 1 their performance relative to Yorkshires is 96.8% for days to market, 88.6% for backfat and 95.9% for feed/gain. The other breed comparisons were developed using the same methodology.

Large Whites have been reported to have an advantage for postweaning performance over that of traditional U.S. Yorkshires. However, since Large Whites are a subpopulation and not a different breed from Yorkshires, some heterosis will be lost when Large Whites are used as terminal sires. How much will depend on the percentage of Yorkshire and Large White in the dam and sire, respectively. For instance if the sow is 50% Yorkshire (e.g. Yorkshire-Landrace F1) and the sire is 50% Large White (e.g. Large White-Hampshire F1) individual heterosis will decrease by 50%. Individual heterosis for days to market is 6.5%. When heterosis is reduced by 50%, the expected improvement is reduced to 3.25%.

This problem can become confusing due to differences in breed means, reductions in performance due to heterosis as well as tracking more than one trait. Examples of different breeding systems were created to sort through these confusing issues to determine what crosses may be most profitable. For comparison purposes the base breeding system was Yorkshire-Landrace F1 sows mated to Hampshire boars. This mating scheme can be found on many farms within the industry. In this base breeding system, pigs from this mating would exhibit all possible individual heterosis.

The first comparison to this base breeding system was the mating of Yorkshire-Landrace F1 sows to White Terminal boars (Large White-Hampshire F1). It was assumed that individual heterosis would be reduced 50%.

Performance expectations of the two systems were developed and compared, using the relative differences of Table 1. From the calculations, progeny from White Terminal sires were 3% leaner than pigs sired by a Hampshire boar from Yorkshire-Landrace F1 females. However, the decrease in heterosis would

increase days to market by 2.5% and slightly worsen Feed/Gain. To determine profit, marginal economic constants suggested by the National Swine Improvement Federation, were used. These were -\$0.12 per day decrease for days to market, -\$1.50 for each 0.10 inch decrease in backfat and -\$0.13 for each 0.10 decrease Feed/Gain. Pigs from the White Terminal boars would be worth -\$0.04/pig than those sired by the Hampshire sired pigs, even though they were leaner. This may be acceptable if there is a need to improve leanness quickly, even though this example suggests that they may be as profitable as those sired by the purebred Hampshires.

It could be reasonably argued that U.S. Yorkshires do have varying amounts of Large White throughout the breed and the aforementioned comparison is not consistent with practice within the industry. Therefore, further comparisons were conducted with an improved Yorkshire population, designated as Y*. The Y* population consisted of 50% Yorkshire and 50% Large White ancestry. The relative merit of Y* to Yorkshires was; Days to Market 98.3%, Backfat 94.3%, and Feed/Gain 97.8%. For the next comparison, Y*-Landrace F1 sows were mated to White Terminal Sires (Large White-Hampshire F1).

Pigs sired by White Terminal boars from the Y*-Landrace F1 sows were expected to take 2.1% longer to reach market weight, however were 4.6% leaner and had slightly improved Feed/Gain when compared to Hampshire sired pigs from the Yorkshire-Landrace F1 sows. This culminated in the White Terminal sired pigs worth \$0.51/pig more than those sired by Hampshires and from Yorkshire-Landrace F1 dams.

Since it can be assumed that many Yorkshires do carry some percentage of Large White genes, one further comparison was conducted to complete this exercise. That was the simulation of mating Y*-Landrace F1 sows to Hampshire boars. The performance expectations of this mating were compared to those of progeny from Yorkshire-Landrace F1 sows mated to Hampshire boars.

Pigs from the Y*-Landrace F1 sows were slightly faster growing than those from the Yorkshire-Landrace F1 sows, were 1.8% leaner and also performed better for Feed/Gain. Pigs from the Y*-Landrace F1 sows mated to Hampshire boars were worth \$0.64 more than those from Yorkshire-Landrace F1 sows mated to Hampshire boars. From this evaluation, postweaning performance was most profitable, when Y*-Landrace F1 sows were mated to Hampshire boars and all individual heterosis was maintained.

It is interesting to note that profitability occurs through an accumulation of performance differences and usually is not driven by one factor. For instance the progeny from the mating of Y*-Landrace females to the White Terminal boars were leaner than those from the mating of Hampshire boars with Y*-Landrace females. However since progeny from the Y*-Landrace females and Hampshires boars grew faster and had better Feed/Gain they were more profitable.

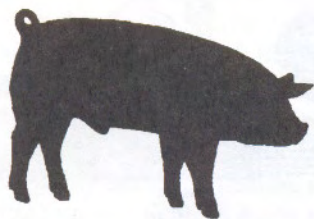
This short evaluation of the potential of White Terminal sires demonstrates two things. The first is that individual heterosis does provide an important boost to postweaning performance. In general, an individual heterosis loss of 25% or more will cause a decrease in overall postweaning performance and may lead to decreases in potential profitability. The second point is that maternal lines or breeds must be adequate for postweaning performance. When maternal lines are average or above for postweaning performance (as were the Y*-Landrace females), postweaning profitability can be increased when individual heterosis is optimized.

One final note, the assumptions made in the analyses provided here, do influence the outcomes. For example, if the Large White means were more extreme than noted, the outcomes may have been different. However, when evaluating any population(s) in regard to their use in crossbreeding systems, their performance expectations must be well documented to determine their relative worth.

Table 1. Relative Performance Differences Among Breeds Compared to Yorkshires^a

Breed	Days to Market	Backfat	Feed/Gain
Large White	96.8	88.6	95.9
Landrace	100.8	109.5	101.9
Hampshire	100.5	96.0	99.7

^aYorkshire performance values considered average or 100.



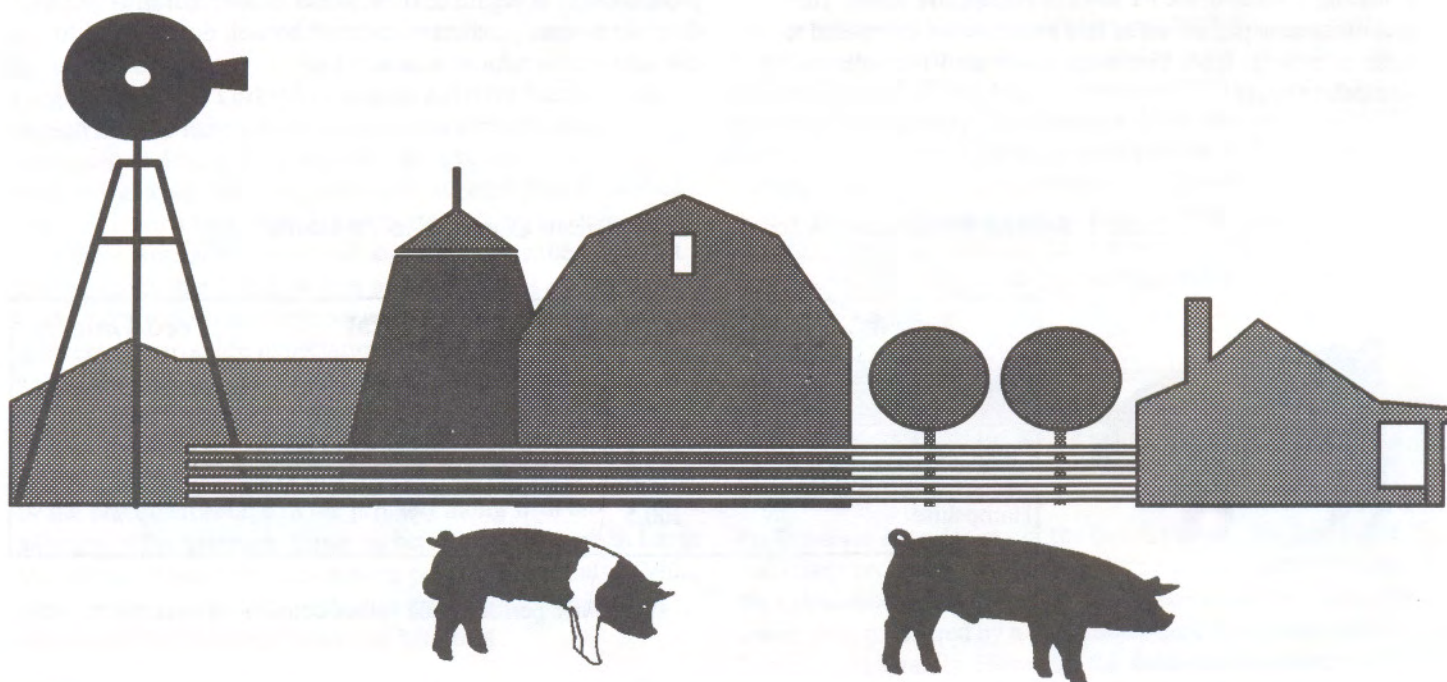
The Value Chain

by Mike Cowley, Extension Swine Agent, Southwest Michigan

Michael Porter of Harvard University proposed the value chain as a tool for identifying ways to create more customer value. The concept of value chain analysis may be the major reason why several American industries have made great strides in improving customer satisfaction in the recent past. Value is defined as the satisfaction of customer requirements at the lowest possible cost of ownership or use. Each individual has different levels of cost and quality requirements when it comes to purchasing goods and services, so value is essentially defined by the consumer. However, if companies can adopt a continuous improvement culture in terms of reducing costs and maintaining or increasing quality (by reducing variation) there is a good chance they will be rewarded by increased market share.

A value chain for a single business can be defined as all the activities and resources involved in producing and marketing a product. For example, the value chain for a pig farm would start with the procurement of raw materials and end with the marketing of live hogs. It would include all the resources the farm has control of (e.g. labor, buildings and equipment, and breeding stock) and would link them to all the activities in the production process. The value chain for the pork industry would begin with the production of feedstuffs and end with the consumption of pork products by consumers. Every stage in between is a link in the value chain. Many industries have made great strides in evaluating and analyzing their respective value chains. Every activity in the chain should add value to the end product and variation of all types should be reduced as much as possible. By adopting sophisticated information systems, many industries have been able to identify non-value

adding activities and either reduce their effects or eliminate them entirely. This is highly dependent upon the information flow up and down the chain. For the most part, the information flow within the pork value chain is extremely poor and as a result there are major opportunities for reducing unnecessary costs. For example, most pork producers don't understand the cost structure of slaughter and processing firms and vice versa. However, when you look at larger farms that are vertically integrating or forming strategic alliances, it becomes clear that they have a distinct advantage in reducing non-value added costs. Packer or marketing contracts are an example of forming an alliance that helps packing plants and producers reduce cyclical and seasonal variation. This variation tends to be a huge non-value added cost that is ultimately passed on to the consumer. Any increase in variation, regardless of what it is, can be correlated to a reduction in product value. Poultry firms have been able to implement information systems throughout their value chains so that each sector knows the cost structure of its suppliers and internal customers. When one sector's cost structure changes all the other sectors are able to make necessary adjustments to insure the highest possible value of the final product. Not to suggest that the pork industry follow the ways of the poultry industry in terms of consolidation, but there are some definite opportunities for independent producers to reduce unnecessary costs throughout the chain. The value chain is a good framework for helping producers develop their business mentality for the future. Increased consumer value does not guarantee increased market share in a competitive market, but if value becomes static it essentially guarantees failure.



Environmental Assurance on the Farm

by Joseph Kelpinski, Extension Swine Agent, Northeast Michigan

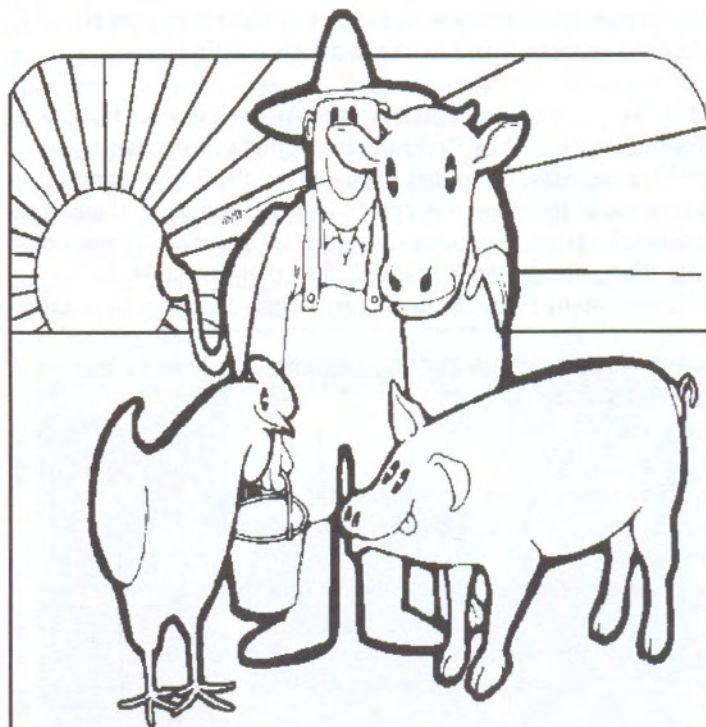
The first nine Environmental Assurance Programs (EAP) offered at locations around the state have been completed. During the meetings several things have become apparent to the members of the MSU Extension swine team regarding manure nutrient management on the farm. Most of the items have been very positive; producers are seeking odor solutions and are trying to the right thing with regard to the storage and application of manure. Hopefully producers will continue these improvements with further education and the evolution of manure management practices on the farm. Continued emphases on the EAP program and on the items learned about in these educational meetings are important. Voluntary participation will demonstrate to the public that not only is the swine industry concerned about environmental issues, but that we are the nationwide leader among the livestock commodity groups in addressing environmental issues and concerns.

The EAP program consists of six main modules: an introduction/farmstead self-evaluation and regulatory update, manure storage systems, composting, odor control strategies, critical control points (HACCP on the farm), and community relations. Each of these modules contain a great deal of information which, when practiced on farm, can SIGNIFICANTLY reduce the potential for air and surface/groundwater contamination. One of the most interesting things to occur during these programs was during the introduction module when we polled producers as to why they were attending the EAP program. Concern for the environment was the unanimous number one choice. It was abundantly clear that producers regardless of size held this concern. Producers ranged in size from 25 sows to over 5000 sows in size at these programs and yet this concern was clearly voiced by virtually all participants. This response makes it clear that producers in our state are very aware of the potential negative impacts of their operations on the environment.

At these first nine EAP meetings, 191 producers received training and EAP certification from NPPC. Those producers who have attended this program now need to take the next step and work with their local swine agent in writing a sound nutrient management plan for their operation. It is our hope in the next 12 months to significantly increase this number of environmentally certified producers. The advantages to you as producers by going through the EAP program are many: the ability to demonstrate environmental awareness and sensitivity to neighbors and township officials, protection from punitive damages from the Michigan Department of Environmental Quality in the event of a manure spill (contingent on you operating under Michigan Right to Farm guidelines AND having a current EAP certificate), writing a sound nutrient/manure plan for your farm, implementing an emergency action plan for your operation, and understanding

how to fully utilize your manure in an agronomically sound manner. Each of these factors by themselves are good enough reasons to become EAP certified, combined together they virtually demand that each producer attend these programs.

Many regulatory changes are on the front burner in Congress to force changes in our industry. Items such as the Harkin Bill and proposed changes at the EPA and USDA concerning C.A.F.O.'s (Confined Animal Feeding Operations) could seriously impact the way we currently raise hogs as well as our individual bottom lines. Only by becoming more proactive on these environmental issues can we prove that we don't need additional regulations to maintain environmental safety. For those producers who have already gone through the EAP program, you are to be commended for taking this first step. For those who have not been through the program yet, I STRONGLY encourage you to consider doing so. We will be more than willing to conduct the program again in any area of the state to satisfy local demand, so get your pork producing neighbors or county groups involved as well. If you are interested in becoming EAP certified, please contact your local MSUE swine agent for further information.



Where's the Plan ?

by Tim Johnson, Extension Swine Agent, West Michigan

In an earlier article in this newsletter, Joe Kelpinski discussed the Environmental Assurance Program (EAP) and the importance of participation and certification. What is important is to have a plan to deal with the issues of concern. As you all are aware, the public is concerned with your ability to protect the environment. The problem lies in the fact that you are already an environmentalist, if you weren't, your ability to grow crops and make a living off the land would not exist. Pork producers have been farming based upon experience for generations, but along the way comes generations of consumers who no longer have a "feel" for what farmers do each and every day. With this lack of knowledge comes fear, fear that farmers may not have the non-farming community's best interest first and foremost in their daily thoughts and actions. This fear is why efforts to plan and document the plan are essential to your continued ability to operate your farm. A documented plan gives some assurance that actions have been thought out and can be referred to when needed to ensure proper procedures are being followed. While you may or may not agree with the argument, it is reality in today's world, agriculture no longer drives the issues, food is to cheap, and others want a say in what you do and how you do it. With that in mind, what I would like to do in the remainder of this article is take a segment of one of those EAP meeting topics and expand upon it a little. The intent being to give everyone some additional tools to proper nutrient management on the farm, provide information as to what to address in your farm plan and encourage you to attend a EAP meeting.

Many of us have heard about Hazard Analysis and Critical Control Points (HACCP) for the inspection of carcasses in the packing industry. What has been done in the EAP program is to take some of the same concepts of HACCP and apply them to the farm with regard to manure nutrients. Perhaps we should begin with the basic principals of HACCP so that we can be thinking of how to apply HACCP on the farm when dealing with manure.

Seven Basic Principles of Hazard Analysis and Critical Control Points

- Identify hazards
- Find critical control points in the process
- Establish critical limits for each critical control point
- Monitor
- Take corrective action if monitoring shows deviations outside the limits of the control point
- Verify that the HACCP plan is working correctly
- Keep records on each control point

Identify Hazards

The first step is to identify the hazards. An important thing to realize is that each farm is unique and your set of hazards may be different than the neighbor's farm down the road. Some of

the hazards for manure handling may be items like over-application of manure to cropland, application to close to waterways or wells, leakage or discharge, and application to frozen ground.

Critical Control Points

Once hazards have been identified, the next step is to identify the critical points in the process to ensure that everything is proceeding as planned. The first critical control point is to monitor manure generation. Do you know how much manure is being generated and do you know how manure generation changes during the production process? For example, do you know how much volume is generated in the second month of a group of finishing hogs in your AIAO facility? If the volume is significantly higher than expected, do you have a water leak somewhere? If the volume has actually declined from previous measurement, where is the leak in the pit? The second critical control point involves the storage of manure. Is the storage facility doing the job it was intended to do? Is there proper containment and retention of manure? What is the remaining capacity of the storage? We have all seen the pictures of lagoon breeches and the negative publicity that something like that brings to the entire pork industry. Are you able to say without a doubt that your storage won't be on the six o'clock news highlight reel? A third control point involves the transport of manure. On many farms today, manure is transported on public roads to cropland in other areas. How are you going to get the manure to those other areas and what precautions are you taking while doing so? Do you have a plan to clean mud and debris off the road after leaving the fields? Do you check the valves on the tanker spreader regularly? If you pump manure to a dragline or irrigation system, have you checked for leaks at pipe joints? What if you are crossing a ditch with the pipe, have you put in a permanent pipe over the ditch to put the irrigation pipe in; not only for support, but to ensure that a leak does not contaminate surface waters? The fourth and final critical control point involves the actual application of manure to the land. Have you tested the manure so that you know how many nutrients you are applying? Based upon your crop plan, how much manure should be applied for crop uptake and growth? Is the manure being applied to maximize nutrient availability to the crop and minimize odor? And finally, is there a potential runoff problem?

The list of critical control points might seem endless, especially when you consider the many steps involved with the storage, handling and application of manure. Many of the items you do automatically, if you write the critical control points for your operation down, perhaps you can avoid making a costly mistake on the day when you have many other things to attend to.

Limits for Critical Control Points

Once you have the control points, you can establish limits for those parameters that could cause a problem. For instance, with

regard to storage, if monitoring the storage finds you have only 12 inches of space remaining, and it is only February, you will know that you have a problem looming in the coming months. You can start making some plans to handle the manure now rather than at the last minute when the pigs are beginning to take swimming lessons. You can also set limits for maintenance and inspection of equipment. Do the valves on the tanker spreader get checked daily or only when they fail to hold the manure in the tank? When applying manure, do we only apply a certain amount to a field based upon cropping plans, or do we apply on the same field until the storage is empty? Critical control points only work if we set goals or targets to follow.

Monitoring

The next step once you have developed the plan is to monitor the plan to see if all is going according to plan or if fundamental changes in the plan may be needed. The development of checklists to ensure that the plan is followed may also be advantageous. Lists to cover the critical control points associated with manure generation and storage could be completed monthly. Checklists for manure application can be utilized as needed during times of application and transport. Annual lists can be utilized for items such as soil sampling, manure testing, well testing and updating the plan. The nice point about these checklists is that they provide you with the documentation that is needed if an accident should occur or a complaint comes into the MDA.

Corrective Action

This point in the HACCP plan is easy, if you find that something is outside the limits established in the critical control points, you take the appropriate corrective action and document the action that was taken. This area also involves the development of an emergency action plan so that a written course of action is available to handle emergencies. While this discussion is focused on manure spills, an emergency action plan can also be expanded to handle other types of problems on the farm. Agriculture is inherently dangerous, do you know who to call for assistance, and more importantly, do your employees know who to call when you are not around?

Verification

The verification process involves the records and documentation to confirm that the manure handling practices are appropriate and effective for a given operation. Accurate documentation can go a long way to defending your operation against challenges from nuisance complaints or lawsuits. Think of your manure management records in the same way as your handle your restricted use pesticides. You should document everything you do with regard to your manure storage, handling, transport, and application. You should also document the response and action to any emergencies that might have occurred. Another component of the verification process may involve a third party evaluation. An evaluation provides an opportunity for an outside party to objectively review your manure handling system and practices. It provides that extra set of "eyes" to assist you with evaluating your operation. An evaluation also provides you with documentation of your compliance with accepted practices for

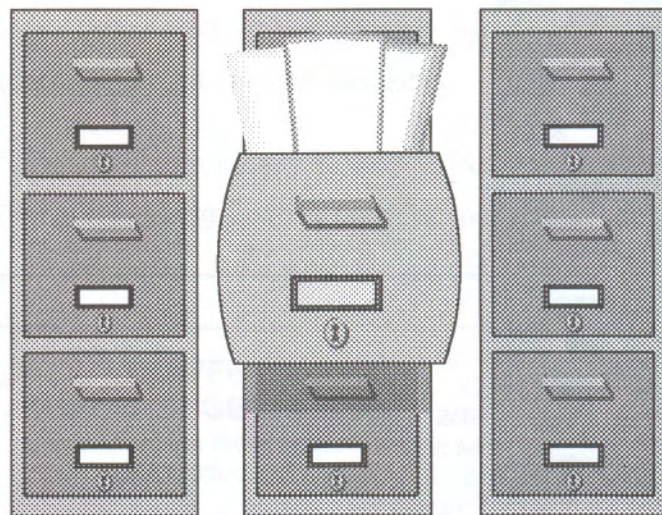
manure management procedures if you are ever questioned about them. The MSU swine team is utilizing a standardized form from the NPPC to conduct the third party evaluation and will leave all the forms with the producer once the evaluation has been completed. The evaluation is meant as a tool to help producers find those weak spots in their plan and so they know where to focus their efforts to improve.

Records

As mentioned earlier, remember to document, document, document. Your ability to keep good, accurate records of activities on the farm may be the difference between a big headache and a short, friendly chat with various regulatory agencies. The important thing with regard to records is to make it fit into your daily schedule and require that it be done. Also, keep the records in an organized file and keep them for at least three years. Records do not have to be intimidating; the EAP program has forms available to handle most of the required information discussed. All you have to do is fill in the blanks and file it. Also, remember that your swine extension agent is ready to assist you with getting your plan implemented.

Summary

Nutrient management is an important component of farming today. The Environmental Assurance Program is a voluntary program for pork producers interested in improving nutrient management practices on the farm. The EAP also gives the producers the necessary tools to reach their nutrient management goals. Participation in an EAP program will also help producers improve community relations by being seen as being proactive in addressing some of their communities concerns with regard to manure and odors. The MSU swine team with assistance from the Michigan Pork Producers Association, Michigan Department of Agriculture and the National Pork Producers Council is offering pork producers the opportunity to get the education and training necessary to enable them to meet the challenges of tomorrow. If you are interested in what the EAP program may have to offer your operation, please contact your swine extension agent. The names and phone numbers of the nearest agent can be found on the back cover of this newsletter.



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