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Keys to Successful Company-Grower Relations

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INSIDE

Good Relations are Important

Poultry production costs are at an all time high which means financially challenging times for the industry. No one needs to be reminded that when money is tight, frustration levels for both growers and company personnel can soar. That's why it is important to remember the basics of being a good flock supervisor because actions that fuel grower unhappiness will benefit no one.

By focusing on and practicing the key elements for a positive working relationship, company personnel can help maintain grower confidence and help improve profitability even during tough times. Growers also can benefit from practicing relationship building skills because it helps demonstrate their desire to have the company's support. Even the most inexperienced service technician will be more of an asset when growers treat the individual with respect and appreciation and vice/versa. The following paragraphs outline relationship building skills that are tried and true as noted by a long time successful poultry man. Sometimes just a little reminder of the basics is all we need to keep our business on the right track.

THE SIX SENSES FOR SUCCESS

Sense of Awareness

Service technicians today carry a greater burden of responsibility than their predecessors and that makes it critical that eyes and ears remain wide open at all times. Any savvy old timer will quickly agree that it is usually overlooking/missing the little details that create some of the biggest challenges in poultry production. Unfortunately, in our current world of information overload, we often put on blinders because we feel it is the only way we can not be mentally overwhelmed. So the next time you find yourself distracted from the basics or consumed by issues that really are not essential to the core business of successful poultry farming, sit down with your best poultry grower and let them remind you what is important for producing a good flock. Use that information to make a checklist of what to notice when you pull on a farm or enter a barn. Writing it down and keeping it handy can help service technicians maintain a high level of awareness for the issues that count most. Be aware and focus on issues which you can correct or control!

Management Intensity

Closely associated to sense of awareness is maintaining focus on what is critical to the mission of rearing profitable flocks. That's where the checklist comes in handy. Again, the information age has resulted in distractions that can eat up a lot of time and attention with little value to the grower, the service technician or company. Knowing what is important to the success of the business and staying focused can have a tremendous impact on your credibility as a company representative. Maybe it's time for a farm inventory to see that everything that's supposed to be in place is being properly utilized. If you have high feed prices, which

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. . . helping ensure the efficient production of top quality poultry products in Arkansas and beyond.

we presently do, then your intensity should be on improving feed efficiency. Every point of feed conversion improves the company and producers pay check.

Sense of Urgency

When service personnel do not address issues or problems in a timely manner, they risk destroying their credibility with the grower and value to the company. When a grower concerned about a sudden spike in mortality calls, it is time to take immediate action because it is not only the grower's livelihood that is threatened, but also yours as the company representative. Time is of the essence when diagnosing and correcting issues that involve delicate living creatures like commercial broilers and turkeys. If you do not care enough about your growers business to respond quickly when your grower sends out an SOS for help, then you are in the wrong business! Providing timely support to a grower can have a tremendous impact on grower loyalty and attitude because the action communicates that you genuinely care. Bottom line, correct the opportunities ASAP/PDQ!

Total Communication

Since service technicians typically spend more time with growers than any other company representative (save the feed truck driver) their ability to represent company policies and good bird management information to the growers is essential. The communication should be clear and concise yet positive whether it is written or spoken. Growers deserve the truth, but they also deserve to have the message delivered in a manner that is understandable and clearly addresses the issue at hand. Growers also deserve a service technician that works as a partner not as a policeman. Windshield time sometimes impairs logic/positive thinking. Stick with and communicate the proper game plan.

Listening

The least taught and most neglected skill in our society is the art of truly listening to others. Once again, the information overload age often causes us to selectively choose the pieces of information we wish to hear and that is usually the bits of info that will make our lives less stressful. Unfortunately many times, the real issues of problems lie just under the surface and may need a little coaxing to get to the root cause. And the only way to get there is often by genuinely listening to the whole message and by asking questions. If a service technician finds themselves distracted and missing a message from a grower that could be crucial information, it is time to practice good listening skills. Sometimes this can be as simple as making a commitment to paraphrase the message that has just been heard. When a person knows they must recall the gist of a received message, an effective practice is to say "Let me make sure I have this straight, you have just told me that …." This practice encourages service technicians to stay focused on the information delivered as well as how the message is delivered. When the grower knows the service technician is focused on their issues, then the communication channels are opened for problem solving. Successful listening and communication is a two way exchange.

Teamwork

Every marketed flock bears many signatures, from the hatchery and breeder manager, to the feed delivery personnel and others. But the most visible signatures on the flock report card are those of the grower and the service technician because they have the most influence on the bird environment, which includes air quality, temperature and availability of feed and good water. Nothing should make a service technician or grower prouder than when their "signature" on a flock are signs of success; low costs, good livability, weights, good gain per day, and feed conversions, resulting in a good pay check. Key to producing a "signature" flock is cooperatively focused team work, with the service technician and the grower being the team leaders.

WHO ARE POULTRY PRODUCERS?

To build a successful and rewarding relationship with contract producers and farm managers, a service technician must understand the grower culture. Producers are managers who are intelligent and often educated if not formally then certainly through hard work and experience. Producers usually have chosen poultry farming because they like independence or the opportunity to be their own boss and set their own work schedules. They have a desire for success and they tend to be goal oriented. Poultry growers are human and like to be treated with respect. Finally, many growers are second and third generation. More and more growers are older and most likely from a generation very different from the generation of the service technician. Poultry growers deal with the same issues as the company; environmental compliance, food safety (proper use of chemicals and reduction of food pathogens), bird well being and increasing production costs. A service technician must be able to explain how flock costs are determined on a performance contract, and the producer should understand the contract and how performance contracts work. The bottom line, service technicians and growers really have much more in common than they are different. By focusing on the common bonds, service technicians can forge a strong relationship with their growers. By understanding and respecting who a grower is, service technicians can build trust and loyalty. Producers are the life blood to any poultry company!

SUCCESSFUL SERVICE TECHNICIAN/ FLOCK SUPERVISOR QUALITIES

Be consistent

Consistent application of company policies and procedures without exceptions is important, but it is also important to recognize that each grower has a different temperament and personality. Some growers require only a gentle nudge to get a response, while others may require a

firmer approach. Conscientious service personnel may spend more time seeking to understand growers than dealing with production issues, but it is worth the effort. Going the extra mile for every grower and visiting each farm consistently sends a powerful message to growers you care and seek to be as fair as possible. It is also important to be diligent. Don't wait too long to implement corrective action. Follow-up when you request a grower to implement a solution to a problem. If you are not diligent, the word will get out that you do not stick to your goals or become inconsistent in your expectations.

Be professional

Always treat producers with respect even if the relationship becomes strained. Remember everyone can have a bad day due to personal problems so when mindsets are bad, wait to address issues. Always be totally truthful. Never be afraid to admit when you are wrong and be willing to apologize when you are at fault. Documentation is a very important aspect of professionalism. Keep accurate and detailed records to help prevent miscommunication.

Be fair

Let farm managers/producers know you care and that you want them to be successful. Make sure requests to growers are realistic and doable. Recognize and praise good work.

Be focused and spend time wisely

Do not let the job become boring and routine. Avoid redundancy which leads to boredom and complacency. Often we can be overwhelmed by how much needs to be accomplished and it becomes so overwhelming that it is almost tempting to just do nothing. Once again it can be easy to get in a rut so when you find self losing focus or motivation to do a good job, then find at least one thing on each farm to focus on. It could be air, litter or water quality, but take that concept and make sure you have helped that producer get the best that he can with that concept. Then move to another area. By breaking the production cycle into specific categories, then focusing on specific topics, the job can become manageable. Other ways to break the rut cycle are conducting a farm inventory. It is amazing how many times we can find things that need to be addressed when we specifically look at all the details. One example of a farm inventory step would be to count all the brood stoves and categorize them into working or non-working stoves. Do the same with feed pans, nipple drinkers etc. You very well may help a producer identify root causes to problems.

Ask for feedback

Just like the trucks which have the "How's my driving?" signs, we need feedback to assure we are effectively performing the job. It is amazing how many people including growers will never say a word about a topic until asked. If a service technician genuinely wants to help a grower improve their bottom line then try asking the following questions.

- What can I do to help?
- What do you need to succeed?
- What do you think?

If nothing else, this helps establish that the grower-service technician relationship is a partnership.

Explain the importance of issues

Set the right example by knowing the business yourself. This makes it much simpler to educate others and when we educate, we stand a much better chance of convincing others that our ideas are solid.

Credibility

Credibility is based on having a genuine understanding of the business including grower costs and pay. A service technician should be able to explain flock costs on a settlement sheet because it proves credibility as a company representative. It also builds trust if a service technician genuinely understands and cares about the business. No one has all the answers all the time. Therefore if the grower raises a question which the service technician can not readily answer; credibility can be made by assuring the grower that you will get an answer and then follow through in a timely manner.

Conclusion

Which rung on a ladder is the most important? Every rung is equally important and this theory is the same for poultry production. Every signature on a flock is equally important in the success or failure of the flock, but there are certainly two flock signatures, namely the grower and the service technician which are the most visible. During tough times, the necessity of a strong service technician-poultry grower relationship is critical. By focusing on the six senses of success, knowing the business and taking time to practice the qualities of success, service technicians can build bonds with growers that will weather hard times.

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Applied Broiler Research Farm Report: Production Results and Economic Returns Before and After Renovations

Although birds grown after renovation were 4 days older and 1.6 pounds heavier, they showed a one point better feed conversion than did birds grown before renovation.

Introduction

Renovations at the University of Arkansas Poultry Science Department's Applied Broiler Research Farm (ABRF) were completed in April 2006. Six flocks of broilers have been harvested on the 4-house commercial-scale farm since renovations were complete. This report compares the average production performance results of those 6 flocks to the 5-yr average performance prior to renovation on an individual house basis as well as for the farm as a whole.

Performance Results

Table 1 lists average broiler performance at the ABRF before and after renovation. Since no differences were seen between condemnation rates, these data were left out of Table 1. Even though about 2% fewer birds were placed per house after renovation than before (22,374 before renovation versus 20,579 after renovation), these data were also not included. Prior to renovation the ABRF averaged a 4.33 lb bird at 42 days of age with a 1.88 feed conversion, a livability of 94.90%, a 0.103 lb average daily gain and 91,257 pounds produced per house annually. After renovation the ABRF averaged a 5.92 lb broiler at 46 days of age with a 1.87 feed conversion, a livability of 95.57%, a 0.129 average daily gain and 114,449 pounds produced per house annually. Although birds grown after renovation were 4 days older and 1.6 pounds heavier, they showed a one point better feed conversion than did birds grown before renovation. In addition, when compared to birds grown before renovation, birds grown after renovation had a 0.75% higher livability and gained 0.026 pounds more weight per day. These data indicated that the environment for growing birds was improved after renovations and birds responded to the enhanced care with greater production efficiency.

Table 1. Average broiler performance at ABRF before and after renovation.[1]

House[2]	Age		Feed		Average Wt.		Livability		ADG	
No.	(Da)		Conversion		(Lbs)		(%)		(Lbs/Da)	
	B[3]	A	B	A	B	A	B	A	B	A
1	42	46	1.91	1.89	4.19	5.97	94.49	96.33	0.100	0.130
2	42	46	1.87	1.85	4.39	5.97	95.34	96.42	0.105	0.130
3	42	46	1.87	1.85	4.36	5.90	94.94	95.21	0.103	0.128
4	42	46	1.88	1.88	4.38	5.85	94.46	94.32	0.104	0.127
Farm	42	46	1.88	1.87	4.33	5.92	94.81	95.57	0.103	0.129

[1] Before data represent average performance on 27 flocks placed between 2001 and 2005.
[2] Hse. No.= House Number; Age=Age in days at processing; Feed Conv.=Feed Conversion; Avg. Wt=Average Live Weight at slaughter; Livab=Livability; ADG=Average Daily Gain in pounds per day.
[3] B=Before Renovation; A=After Renovation

Prior to renovation major structural and equipment differences existed between at the ABRF. Before renovation houses 1 and 3 were curtain sided conventionally ventilated, while houses 1 and 2 were curtain sided tunnel ventilated houses. Houses 1 and 2 had R-10 insulation in the roof while houses 3 and 4 had R-19. These differences and others were likely responsible for performance differences between the houses before renovations were undertaken. However, there were also performance differences among the 4 individual houses after renovation. Some of this difference between houses, especially in houses 4 and 3 was likely the result of some very wet experimental bedding material used during the first flock after renovation.

Economic Returns

The data in Table 2 show the average economic returns obtained by the ABRF before and after renovations. Average base pay on the broiler contract before renovation was $0.042 per pound of salable meat and $0.051 cents per pound after renovation. Before renovation pay per pound of salable meat averaged 3.95 cents for the ABRF and the average settlement check per flock was $15,049. After renovation average pay was 5.43 cents per pound of salable meat and the average settlement check has averaged $25,533 per flock. The differences in average pay/lb was (5.43 – 3.95) 1.48 cents, while the difference in average total pay was ($25,533 – $15,049) $10,484. While the increase in pay/lb was welcomed, what part of the increase in total pay was due to improved performance and what part was due to the increase in pay?

Table 2. Average economic returns at ABRF before and after renovation[1].

House[2]	Pay/lb.		Fuel Allow		Total Pay		Sold	
No.	(cents/lb)		($)		($)		(Lbs)	
	B[3]	A	B	A	B	A	B	A
1	3.66	5.38	$133	$189	$3,363	$6,398	87,859	116,126
2	4.11	5.58	$133	$1.89	$3,981	$6,638	93,031	116,239
3	4.02	5.49	$133	$185	$3,854	$6,425	92,071	113,631
4	4.00	5.26	$133	$185	$3,843	$6,072	92,068	111,801
Farm	3.95[4]	5.43	$532	$748	$15,049	$25,533	91,257	114,449

[1] Before data represent average performance on 27 flocks placed between 2001 and 2005.
[2] Hse.No.= House Number; Pay/lb=Grower payment in cents per pound; Fuel Allow=Fuel; Allowance; Total Pay=Total Payment
[3] B=Before Renovation; A=After Renovation
[4] Pay/lb for the farm is a weighted average based upon the pounds sold per house

The average total pounds produced on the ABRF before renovation was (91,257 x 4) 365,029, and (114,449 x 4) 457,797 pounds after renovation (Table 2). If the ABRF could have improved bird performance, but had not received the 1.48 cent pay/lb increase, average total pay would have been (457,797 x $0.0395) $18,083. Thus, ($25,533 – $18,083) $7450 of the increased total pay was a result of improved bird performance. This means that ($7459 / $10,484) about 71% of the increase average total pay increase at ABRF was due to improved bird performance, while about 29% was due to an increase in pay/lb.

Summary

The ABRF produced an average of (457,797 - 365,029) 92,768 more pounds after renovation than before and average pay/lb was 1.48 cents more after renovation. Average total pay per flock at the ABRF was almost $10,500 more per flock after renovations than before. An estimated 71% of the increase in average total pay was due to improved bird performance, while 29% was due to the increase in pay/lb. While renovation had a positive effect on bird performance and economic returns at the ABRF, each grower faces a slightly different situation with regard to economic returns.

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Broiler Chicken Growth in Perspective

Growth curves for virtually all animal species resemble this curve.

It has been stated that: "If you grew as fast as a chicken, you'd weigh 349 pounds at age 2." While this statement may have been originally intended to be a humorous way of emphasizing the rapid growth of commercial broiler chicken strains, it is highly misleading and has been misused. An explanation appears in order.

At present in the U. S. less than 2% of the total population is involved in production agriculture. This means, of course, that a majority of 98% of the population (consumers) has no idea how their food arrives or the challenges involved in production agriculture. Yet, consumers demand inexpensive, tasty and nutritious foods. To meet these demands production agriculture continues to adopt increasingly more efficient production methods. The broiler industry has become more efficient primarily by breeding birds that grow rapidly.

The growth curve shown below is typical of broiler growth. Growth curves for virtually all animal species resemble this curve. However, it is important to realize that the period of rapid growth is short lived and growth slows almost as quickly as it began. The comparison of chicken growth rates with human growth rates used the most rapid growth rates on the curve. Such comparisons are unrealistic because they focus on a short time span when extremely rapid growth occurs and such growth can not be sustained for a long time period.

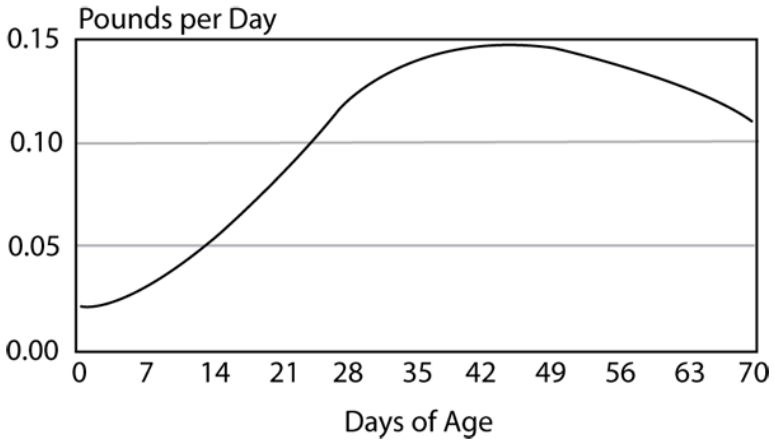

Figure 43-15. Typical Growth Rate of Straight-run Broilers at Different Age

From: Lacy, M.P. 2002. Broiler Management. In: Commercial Chicken Meat and Egg Production., D.D. Bell and W.D. Weaver, Jr. eds., p852

It is also important to understand that birds (including chickens) normally gain weight rapidly. This rapid growth allows birds to gain body mass, mature and reproduce rapidly during warmer months so that chances of survival during the colder months are enhanced. Broiler production takes advantage of this rapid growth to economically produce meat for consumers. However, one must realize that chickens (even those bred for rapid growth) grow two to three times SLOWER that other common bird species. In fact, it might be said, "If you grew as fast as a house sparrow you would weight 698 pounds at age 2."

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Evaluation of Water Sanitizers[1]

Introduction

The poultry industry continues to emphasize the importance of clean drinking water systems for their birds. While there are products available which do an excellent job of eliminating biofilms and completely cleaning water systems of potentially harmful bacteria, not all products are easy to handle nor are they readily available to all poultry growers. In addition, as the use of water acidifiers becomes more popular, the incidence of fungal blooms in water systems has also increased. Most fungi need pH values of 2-6 to survive. When acidifiers are used without a good sanitizer present, then a clear, thick fungal slime can potentially occur, which, once established, can be very difficult to remove. Fungal slimes can also occur after the use of water soluble antibiotics. Antibiotics can impair the growth of bacteria, leaving the system vulnerable to fungal blooms particularly if the grower does not have a good daily water sanitation program. However there are a limited number of sanitizers available for use as water line cleaners which meet the following criteria:

1. Approved by the Environmental Protection Agency as safe to use in drinking water systems,
2. Safe to use and handle,
3. Not corrosive or damaging to the equipment,
4. Effective in removing slime or biofilm from pipes and drinkers,
5. Affordable and available

Because of these and other concerns, the need to identify a variety of good line cleaning products remains important to the industry. Therefore, it is the mission of our lab to continue to evaluate new products utilizing a test method which simulates the slimy conditions that can occur in poultry house water lines.

In this test, five water sanitizers were evaluated for their effectiveness in killing total aerobic (oxygen or air loving) bacteria and molds. The products were:

1. AquaVite - acidified copper based water treatment,
2. PronTech™ - ammonia based cleaner,
3. Proxy-Clean® - 50% stabilized hydrogen peroxide,
4. Oxine® - stabilized chlorine dioxide and
5. Sterilex® - buffered acid product

Methods

Each product was added to 3 replicate beakers of 50 ml of water containing algae. Water containing algae was used to create a heavy microbial challenge for the cleaners. Three untreated 50 ml aliquots served as the control and received no treatment. Prior to addition of the product to the water, an initial aerobic bacteria and mold count were determined for each 50 ml aliquot. Each treatment was tested at the concentrations listed in Table 1. The aliquots were held uncovered at room temperature and retested at 4 and 24 hours post treatment application.

[1] Mention of company or trade names does not constitute endorsement by the University of Arkansas Cooperative Extension Service or Center of Excellence for Poultry Science and does not imply their approval to the exclusion of other companies or products that may be suitable.

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Table 1. Treatment Concentrations.

Treatment	Preparation Methods
AquaVite, pH 1.5	A 1.50 pH stock solution was prepared then 0.39 ml was added to 50 ml of test water.
AquaVite, pH 3.0	A 3.00 pH stock solution was prepared then 0.39 ml was added to 50 ml of test water.
Oxline®	10 g of activator was added to 3.25 oz of Oxline liquid and mixed. After standing for 10 minutes, 1.27 ml of stock solution was added to 50 ml of test water.
PronTech™, 0.50 %	A 0.5 % solution was prepared.
PronTech™, 1.00 %	A 1.0 % solution was prepared
Proxy-Clean®, 0.78 %	A 0.78 % solution was prepared
Proxy-Clean®, 3.00 %	A 3.00% solution was prepared
Sterilex®, 1.25 %	1.17 ml of solution 1 and 1.17 ml of solution 2 was added to 50 ml of test water
Sterilex®, 2.50 %	2.34 ml of solution 1 and 2.34 ml of solution 2 was added to 50 ml of test water.

Results were analyzed using the GLM procedure of SAS. Prior to analysis, the microbial data was converted to log10 to normalize the data set. Significantly different means were separated using the least square means repeated t-test.

Results

The initial aerobic plate counts (APC) did significantly differ among the treatments, but all were 5 logs or higher which translates to over 100,000 colony forming units of aerobic bacteria per ml (Table 2). At 4 hours APC from control water remained unchanged and high as did the two AquaVite treatments. The 0.78% Proxy-Clean® APC also remained high, but were about a log lower than control counts. APC from Proxy-Clean® 3%, PronTech™ 0.5%, PronTech™ 1 % and Sterilex® 1.25% were about two logs lower than control. The Sterilex® 2.5% and the Oxine® treatments reduced APC at 4 hours by 5 and 6 logs respectively. At 24 hours APC was reduced to undetectable levels by the Proxy-Clean® 3.0%, Oxine® and Sterilex® treatments. Aerobic bacteria were detected in all other treatments.

The initial mold levels for each treatment ranged from 1.7 to 3 logs. (Table 3) All treatments except AquaVite completely eliminated of mold from the test waters.

In conclusion, several products were evaluated for their ability to kill aerobic bacteria and molds in the presence of a heavy organic load. Several of the test products significantly reduced the microbial load in the water, while others tested were not as effective.

Table 2. Impact of Different Products on the Aerobic Plate Count in Water

Product Tested	0 Hour Pre Treatement	4 Hours Post Treatment	24 Hours Post Treatment
(Treatment)	Log_{10}APC		
Control	6.10a	6.12a	6.08a
AquaVite, pH 1.5	5.76abc	5.49a	5.75a
AquaVite, pH 3.0	5.72abc	5.76a	5.72a
Oxine®	5.49c	>1e	>1d
PronTech™, 0.50 %	5.82abc	2.82c	2.79c
PronTech™, 1.00 %	6.07ab	2.58c	2.50c
ProxyClean®, 0.78 %	5.86abc	4.23b	3.24b
ProxyClean®, 3.00 %	5.87abc	3.00c	>1d
Sterilex®, 1.25 %	5.79abc	2.58c	>1d
Sterilex®, 2.50 %	5.60b	1.29d	>1d
SEM .16	.16	.3	.12
P Value	.0001	.0001	.0001

a,b,c,d,e Values in a column with different letters were significantly different

Table 3. Impact of Different Products on the Mold Count in Water.

Product Tested	0 Hour Pre Treatement	4 Hours Post Treatment	24 Hours Post Treatment
Product	Log_{10}Mold Count		
Control	3.05a	2.57a	2.87a
AquaVite, pH 1.5	2.07bc	2.42a	2.34a
AquaVite, pH 3.0	1.71c	2.49a	2.33a
Oxine®	2.06bc	>1b	>1b
PronTech™, 0.50 %	2.72ab	>1b	>1b
PronTech™, 1.00 %	2.93a	>1b	>1b
ProxyClean®, 0.78 %	2.79ab	>1b	>1b
ProxyClean®, 3.00 %	2.74ab	>1b	>1b
Sterilex®, 1.25 %	2.42abc	>1b	>1b
Sterilex®, 2.50 %	2.00bc	>1b	>1b
SEM .16	.2	.2	.1
P Value	.0278	.0001	.0001

a,b,c Values in a column with different letters were significantly different

Understanding and Controlling Feral Pigeons

(Columba livia)

... pigeons have been used to carry messages by every major historical superpower from ancient Egypt to the United States of America

Pigeons in History:

Fossil records show that pigeons lived in Jordan and on the Palestinian coast 300,000 years ago, well before humans are reported to have inhabited earth (Haag-Wackernagel, 2002). Pigeons originally lived in caves, on rocky cliffs and ledges in Africa, Asia, Europe, and the Middle East and, as a result, became known as Rock Doves (Disdelle, 2005). While it is unclear exactly when pigeons were domesticated; figurines, mosaics and coins portraying domestic pigeons began to appear in ancient Mesopotamia (modern Iraq) about 4500 BC (Anonymous, 2007b). The domestication of pigeons may have predated domestication of the chicken (Johnson, 1998).

It is likely that the advance of the Roman Empire is responsible for the spread of pigeons throughout Europe (Haag-Wackernagel, 2002). European settlers brought caged pigeons for human consumption to Nova Scotia in 1606. Those birds that escaped are apparently the ancestors of present day feral pigeons (Johnson, 1998).

Pigeons have been associated with art and religion for centuries. The ancient Greeks gave pigeons to their children as pets, ate them as food and used their manure as fertilizer. The Romans developed a sophisticated production and marketing system for pigeon meat (Haag-Wackernagel, 2002). For centuries in England pigeon feces was declared property of the Crown because it was used to manufacture saltpeter, one of the three components of gunpowder (Blechman, 2006; Hicks, 1997).

Julius Caesar may have been the first to use pigeons to send messages back home from battle. Pigeons have been used as war messengers since. In fact, pigeons have been used to carry messages by every major historical superpower from ancient Egypt to the United States of America (Blechman, 2006). Although electronic communications have largely replaced pigeons, prior to the invention of the telegraph in 1836 and the telephone in 1875, the fastest way to send any kind of news was by pigeon (Lyne, 2002). During World War II the messages carried by pigeons saved the lives of many thousands of soldiers and the British government awarded the Dickin Medal (the animal equivalent of the Victoria Cross) to 32 different pigeons (Anonymous, 2007a).

However, the relationship between humans and pigeons appears to have been a love-hate relationship from the beginning. Several million people adore the domesticated pigeons they breed for food, for racing or for their beauty. In addition, many enjoy feeding and observing the feral pigeon population. Yet the feral pigeon population has created problems in cities for centuries. Writings from 4000 years ago mention birds [probably pigeons] “spreading feces in the street” (Haag-Wackernagel, 2002).

Biology of Feral Pigeons

Pigeons measure 11 to 14 inches from bill to tail, weigh 9 to 13 ounces and have a wing span on 20 to 26 inches. Males are bigger than females. While most pigeons are gray in color, up to 28 different color patterns can be found in feral pigeons.

Pigeons eat mostly seeds and grains, but can also eat insects, fruit, vegetation and food people (intentionally or unintentionally) provide (Link, 2005). Pigeons are not fussy eaters because they have a poorly developed sense of smell and few taste buds. Pigeons have only 37, while chickens have 316 and humans have about 7,000 taste buds (Calvin et al., 1957; Roura et al., 2007; Disdelle, 2005).

Most birds take sips of water and then throw their heads back to let the water trickle down their throats. Pigeons and their relatives suck up water by using their beaks like straws. This characteristic allows pigeons to consume water rapidly and to access virtually any source of water (Link, 2005).

Feral pigeons are highly social creatures that choose to live in colonies, though not required by nature to do so. Pigeons can fly 40 to 50 miles per hour and travel up to 600 miles in a day, but most feral pigeons do not migrate. While most city pigeons stay close to home, flying less than 12 miles in a day, they can fly much further if necessary (Disdelle, 2005).

Feral pigeons are one of the few larger animals that have been able to adapt to the hazards, noise, and

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hectic pace of big city life (Haag-Wackernagel, 2002). Indeed, pigeons inhabit virtually every city in North and South America, often enjoying year long breeding seasons. Pigeons are monogamous and mate for life (Link, 2005). Depending on the locale, pigeons generally lay eggs and rear young six to ten months each year, taking time off in or near winter. While starlings reproduce in synchrony so that in a given area eggs are laid and hatched within a few days of each other, the reproduction of pigeons is not synchronized. Therefore, some pigeons are generally nesting every month of the year even in colder climates, but peak breeding season is usually in spring and fall (Johnson, 1998; Williams and Corrigan, 1994).

Pigeons make well-hidden nests on high ledges, under bridges, or in empty buildings. Males generally bring nesting materials to the females one piece at a time for nest construction. Pigeons usually lay two white eggs. First eggs produce males about 70% of the time, while second eggs tend to produce females. Consequently, pigeon populations usually consist of equal numbers of males and females. The parents take turns keeping the eggs warm. Males usually stay on the nest during the day and the females stay on the nest at night. Eggs take about 18 days to hatch (Johnson, 1998; Lyne, 2002). An average of about 70% of eggs hatch and 55% of eggs result in a fledged chick (called a squab) (Johnson, 1998).

A few days prior to hatch the crops of both males and females begin producing a cheesy substance called crop milk. During the first few days of life squabs are fed exclusively crop milk, which both parents regurgitate. Early researchers suggested that the nutrient content of crop milk closely resembled the nutrition the bird received from the egg prior to hatching (Davies, 1939). Crop milk is a semi-solid material containing about 71% moisture, 17% protein, 10% fat, 1% minerals, 1% starch and antibodies that protect the young bird from disease causing organisms (Sales and Janssens, 2003; Davies, 1939; Haag-Wackernagel, 2002). About three days after hatching, parents begin to mix grains with crop milk and gradually replace crop milk with grains. Young leave the nest (fledge) at 4 to 6 weeks, but the second clutch of eggs is laid one to two weeks before squab from the first clutch fledging. Eggs from the second clutch require incubation and males assume the greater role in squab care during clutch overlap (Johnson, 1998; Williams and Corrigan, 1994). Pigeons breed up to six times per year depending on the climate and available food supply (Anonymous, 2007c). Pigeons can live up to five years in the wild, but can live for more than 15 years when raised by people (Williams and Corrigan, 1994).

Problems with Feral Pigeons

While pigeons have some admirable characteristics, it has been estimated that larger modern cities contain one feral pigeon for every 20 people (Haag-Wackernagel, 2002). One feral pigeon has been estimated to produce between 22 and 26 pounds of feces annually. When large colonies are present, droppings tend to accumulate in roosting and breeding sites. Walkways can become dangerously slippery, resulting in accidents and broken bones. Feral pigeons can also destroy vegetation when searching for food. The damage in cities caused by feral pigeons has been estimated at $34 to $48 per bird per year. Pigeon droppings can also encourage the growth of fungi that damage limestone, leading to erosion of historic buildings and monuments (Haag-Wackernagel, 2005). Pigeon droppings can also cause structural damage to barns or silos, and nest building in electrical panels, junction boxes, or lights may cause short circuits and fires (Lyne, 2002).

Pigeons have been known to harbor several species of round worms and tapeworms as well as diseases such as ornithosis, encephalitis (of several forms), Newcastle disease, histoplasmosis, cryptococcosis, toxoplasmosis, *Salmonella*, pseudotuberculosis, and coccidiosis. In addition, pigeons commonly harbor ectoparasites such as fleas, lice, mites, ticks, several mite species (including the northern fowl mite) (Williams and Corrigan, 1994). Feral pigeons have been reported to carry at least 70 species of microbial pathogens and 17 different ectoparasites that affect humans (Haag-Wackernagel, 2005).

Controlling Feral Pigeons

Reducing or eliminating large numbers of established feral pigeons can be a difficult and time-consuming task, particularly around poultry facilities. However, persistent efforts can yield results.

• Habitat Modification

The first step in addressing feral pigeon control is the elimination of feeding, watering, roosting, and nesting sites. Discourage people from feeding pigeons and clean up spilled grain or feed around facilities. Eliminate pools of standing water that pigeons use for watering. Holes in buildings should be boarded up or covered with quarter-inch galvanized wire mesh to prevent access. Locate and destroy nests and eggs at 2-week intervals to reduce pigeon numbers. However, habitat modification efforts should be used in conjunction with other control methods (Williams and Corrigan, 1994).

• Birth Control

In recent years major cities have experienced significant problems with feral pigeons. The countless sites available for nesting have made the problem difficult to address. However, at least one product has been developed that is reported to reduce the pigeon population through birth control. The product reduces the hatchability of pigeon eggs as a means of population control (Anonymous, 2007c). The product is reported to act by interfering with the membrane separating the egg yolk from the egg white (called the vitelline membrane). The active ingredient in this new product is nicarbazin (USEPA, 2005). Nicarbazin is approved by the U. S. Food and Drug Administration for the prevention of coccidiosis in broilers (USFDA, 2002).

• Poisons

While several poisonous substances are legal and available for the control of feral pigeon, they may require special permits for use. In addition, it is important to remember that poultry production houses are raising birds destined for human consumption. While it may be remote, flocks can be exposed to the poisons used and residues may be found in the foods produced. Thus, the use of poisons for control of feral pigeons around poultry facilities is not recommended.

• Chemical Repellents

Various nontoxic chemical repellents are available. Although chemical repellents may be effective in many situations, the effectiveness of repellents is usually lost over time, especially in dusty areas (such as poultry facilities). Thus, the use of repellents may be economically shortsighted because they are expensive to reapply. In addition, if people fail to use and monitor sticky products properly, these products can cause pigeons and smaller birds to suffer unnecessarily when they get stuck in them (Williams and Corrigan, 1994).

• Harassment Techniques

Harassment techniques generally have little permanent effect on pigeons, particularly at well-established roosting and nesting sites. However, harassment methods can be effective when used be-

fore pigeons become accustomed to using an area or on small groups of pigeons.

The use of colored flags, balloons, ultrasonic sound, magnetic pulses, and various kinds of scarecrows (e.g. snakes or owls) have been shown to be ineffective. On the other hand, systems that directly contact pigeons such as installing sprinklers in roost trees or lighting up a roosting site with bright fluorescent lights generally produce more reliable results (Haag-Wackernagel, 2002).

• Install Barriers

The cost of installing barriers on large buildings with extensive roosting sites may be impractical. However, barriers are valid options for smaller areas. Yet, established pigeons will fight any type of barrier put in place, especially if it is a popular nesting or roosting site. In such cases, the removal of pigeons prior to installing barriers is most effective.

Installing sheet metal, wood, or other material at a 60-degree angle over ledges, placing metal or plastic spikes (porcupine wire) or electrified systems that are designed to shock birds without killing them, can be effective when installed in roosting, loafing or watering sites. Installing bird netting to block off indoor roosting and nesting areas can also be effective. Two inch mesh netting works well for pigeons, and it isn't as likely to trap small songbirds as the light, small mesh material. If the cost of new netting is prohibitive, used gill netting may be purchased from fishermen or fish hatcheries (Link, 2005).

• Trapping

Pigeons can be effectively controlled by capturing them in traps placed near their roosting, loafing, or feeding sites. The key to successful trapping is pre-baiting areas for several days before beginning the actual trapping. To pre-bait, attractive baits, such as corn or milo, are placed around the outside of the traps for 3 or 4 days before placing them inside the traps, once set, visit traps daily. If birds become "trap-shy," traps can be left open for 2 to 3 days and then reset again for 4 to 5 days. Select another site if traps fail to catch a sufficient number of birds. Trapped birds should be quick and humanely euthanized. Releasing pigeons back to the "wild" is impractical since pigeons are likely to return even when released 50 or more miles from the problem site. If you cannot humanely kill them yourself, find a falconer or wildlife rehabilitation center that will accept live pigeons to feed to hawks (Williams and Corrigan, 1994).

• Shooting

Shooting has been effective in eliminating small isolated groups of pigeons. Where permissible, persistent shooting with .22 caliber rifles (preferably using ammunition loaded with short-range pellets), .410 gauge shotguns, or high-powered air rifles can eliminate a small flock of pigeons. Shooting can effectively remove the few pigeons that may persist around the farm. However, check local laws before employing a shooting program (Williams and Corrigan, 1994).

Summary

The domestication of pigeons may have predated the domestication of chickens. Pigeons have benefited humans in various ways for centuries. However, most larger cities contain large numbers of feral pigeons, which deposit feces in public places, causing damage to public property and creating hazards for humans. Pigeons are known to harbor numerous animal and human pathogens as well as internal and external parasites. Clearly feral pigeon populations must be controlled.

References:

Anonymous. 2007a. Dickin Medal. http://en.wikipedia.org/wiki/Dickin_Medal#Modern_era Visited 1/26/07.

Anonymous. 2007b. Domestic pigeon. Encyclopedia Britannica Online: http://www.britannica.com/eb/article-9030860 Visited 10/25/07.

Anonymous. 2007c. Rock pigeon. Wikipedia. http://en.wikipedia.org/wiki/Rock_Pigeon Visited 10/9/07.

Blechman, A. D. 2006. Cool facts about pigeons. http://www.andrewblechman.com/cool_facts.html Visited 10/26/07

Calvin, A. D., C. M. Williams and N. Westmoreland. 1957. Olfactory sensitivity of the domestic pigeon. Am. J. Physiol. 188(2):255-256

Davies, W. L. 1939. The composition of the crop milk of pigeons. Biochem. J. 33(6):898-901.

Disdelle, R. 2005. Pigeons. http://ehrweb.aaas.org/ehr/parents/pigeons!.html Visited 10/22/07.

Haag-Wackernagel, D. 2002. The feral pigeon. http://pages.unibas.ch/dbmw/medbiol/haag_6.html Visited 10/26/07

Haag-Wackernagel, D. 2005. Parasites from feral pigeons as a health hazard for humans. Ann. Appl Biol. 147:203-210.

Hicks, C. 1997. Technical history of gunpowder manufacture. http://cjhicks.orpheusweb.co.uk/gpdet.html Visited 10/26/07

Johnson, R. F. 1998. Feral Pigeons. The Kansas School Naturalist 45(2):1-6. http://www.emporia.edu/ksn/v45n2-december1998/index.html Visited 1/31/07

Link , R. 2005. Living with wildlife – Domestic pigeons (rock doves). Washington Dept of Fish and Wildlife. http://wdfw.wa.gov/wlm/living/pigeons.pdf Visited 10/26/07

Lyne, T. B. 2002. Pigeons. http://www.globalbirdcontrol.com/pests/pigeons.htm Visited 10/18/07

Roura, E. B. Humphrey, G. Tedo and I. Ipharraguerre. 2007. Unfolding the codes of short-term feed appetence in farm animals. Proc. Western Nutrition Conf. pp 127-154. September 25-27, 2007, Saskatoon, SK, Canada

Sales, J. and G. P. J. Janssens. 2003. Nutrition of the domestic pigeon (Columba livia domestica). World's Poult. Sci. J. 59:221-232.

United States Environmental Protection Agency. 2005. Pesticide fact sheet: Nicarbazin. http://www.epa.gov/opprd001/factsheets/nicarbazin.pdf Visited 11/9/07.

United States Food and Drug Administration. 2002. New animal drugs for use in animal feeds; nicarbazin, narasin, and bacitracin methylene disalicylate. http://www.fda.gov/OHRMS/DOCKETS/98fr/nada-141-124-nfr0001.pdf Visited 11/9/07.

Williams, D. E. and R. M. Corrigan. 1994. Pigeons (Rock Doves). In: Scott E. Hygnstrom, Robert M. Timm, Gary E. Larson eds., Prevention and control of wildlife damage. Coop. Exten., IANR, U. Nebraska –Lincoln, USDA-APHIS Animal Damage Control http://icwdm.org/handbook/birds/Pigeons.asp Visited 1/31/07

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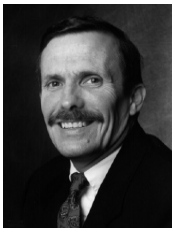

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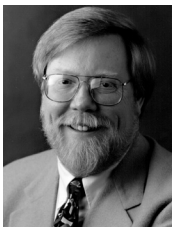

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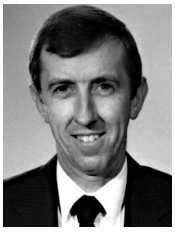

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