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How we're doing: the big picture on poultry health



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Each year, I make a report to the US Animal Health Association (USAHA) about the status of layer health in the US. Here is the report, presented October 22, 2012:

Overall health of the national table egg layer flock continues to be very good. There are no major clinical disease problems occurring. This is due to the several resources and practices available to the industry:

- Continued availability of high quality vaccines;
- Flock supervision from professional, well-trained flock service technicians;
- Readily available veterinary technical assistance from primary breeder, vaccine company, diagnostic laboratory, feed additive suppliers, and consulting veterinarians;
- High quality nutrition provided by professional nutritionists;
- Housing of a majority of layers in environmentally controlled facilities in cages without exposure to litter;
- Use of sound biosecurity practices;
- Continual surveillance for foreign animal diseases or potentially highly pathogenic agents such as Newcastle and avian influenza by our state and federal laboratory system.

A poll of the Association of Veterinarians in Egg Production (AVEP) was conducted within the last month. The members were asked to rate a list of common diseases of caged and cage-free pullets (22 conditions listed) and caged and cage-free layers (31

conditions listed) as to their prevalence in their area of service on a scale of 0 to 3 with 0 = not seen, 1 = seen but not common, 2 = commonly seen, and 3 = seen in a majority of flocks. The survey revealed the following diseases of concern occurring in the US:

Caged Pullets		Cage-Free Pullets	
Condition	Average	Condition	Average
1-Yolk infections	1.43	1-Yolk infections	1.47
2-Starveouts	1.33	1-Starveouts	1.47
3-Marek's	1.00	1-Cocci	1.47
4-E. coli	0.86	4-Marek's	1.27
5-Cocci	0.81	5-Roundworms	0.93
6-Inf. bronchitis	0.62	6-E. coli	0.80
7-ILT	0.60	6-NE	0.80
8-Necrotic enteritis	0.57	8-Aspergillosis	0.40
8-IBD	0.57	8-Inf. bronchitis	0.40
10-Peripheral neuropathy	0.57	8-IBD	0.40
10-Pox	0.57	8-Ms	0.40
12-Bumblefoot	0.48	8-Peripheral neuropathy	0.40
12-Synovitis	0.48	13-ILT	0.33
14-M. synoviae	0.33	13-Synovitis	0.33
15-Mycotoxins	0.29	15-Bumblefoot	0.27
15-Roundworms	0.29	15-Mg	0.27
17-Aspergillosis	0.24	15-UE	0.27
17-Gangrenous dermatitis	0.24	18-Mycotoxins	0.20
17-M. gallisepticum	0.24	19-Pox	0.13
17-Ulcerative enteritis	0.24	20-CAV	0.07
21-Newcastle	0.19	20-Gangrenous dermatitis	0.07
22-CAV	0.05	20-ND	0.07
Total responses	21	Total responses	15

Chick mortality problems are normally associated with small chicks, poor sanitation in the hatchery, or a lack of proper brooding management on the grow farm. As this problem continues high on the prevalence list, the emphasis on solving this issue is apparently not being addressed successfully. The rearing of flocks on litter and exposure to feces complicates coccidiosis in cage-free situations. Marek's in cage-free flocks is also an issue due to the reduced ability to sanitize cage-free facilities between flocks compared to cage houses.

Caged Layers		Cage-Free Layers	
Condition	Average	Condition	Average
1-Cannibalism	1.52	1-Cannibalism	2.06
2-E. coli	1.52	2-E. coli	1.63
3-Ms	1.48	3-Roundworms	1.50
4-Calcium depletion	1.43	4-Mites	1.44
5-Mites	1.29	5-Cocci	1.19
6-FDN	1.20	6-Bumblefoot	1.06
7-Gout	1.10	7-Calcium depletion	1.00
7-Mg	1.10	8-Hysteria	0.88
7-Tapeworms	1.10	9-Ms	0.88
10-Fatty Liver	1.00	10-Tapeworms	0.88
11-Inf bronchitis	0.90	11-FDN	0.81
12-Cocci	0.86	12-Gout	0.75
13-NE	0.81	13-Calcium tetany	0.63
14-Pox	0.76	14-Fatty Liver	0.63
15-ILT	0.75	15-Marek's	0.63
16-Marek's	0.71	16-Mg	0.63
17-Calcium tetany	0.67	17-ILT	0.56
18-Mycotoxins	0.57	18-Mycotoxins	0.50
19-Hysteria	0.52	19-Necrotic enteritis	0.50
20-Bumblefoot	0.43	20-Pox	0.50
21-Roundworms	0.38	21- Inf bronchitis	0.44
22-Synovitis	0.33	22-Ulc enteritis	0.38
23-Ulc enteritis	0.29	23- Synovitis	0.31
24-ND	0.24	24- Fowl Cholera	0.25
24-Spirochetes	0.24	25- ND	0.19
26-Inf coryza	0.19	26- Spirochetes	0.19
26-Leukosis	0.19	27- Erysipelas	0.13
28-Fowl Cholera	0.14	28- Gang dermatitis	0.13
29-Gangrenous dermatitis	0.10	29- Leukosis	0.13
30-Erysipelas	0.05	30- ORT	0.13
30-ORT	0.05	31- Inf coryza	0.13
Total responses	21	Total responses	16

Cannibalism continues to be seen especially in high light-intensity situations, both caged and cage-free. In these cases, the 10-day or younger rule for beak trimming results in longer beaks than desired compared to a beak trim at 4 to 8 weeks and results in an increase in incidence and severity of cannibalism. As this is a major problem for cage-free flocks, genetics companies are placing more emphasis on reducing this trait. The increasing use of large colony cages may also increase the level of cannibalism.

Colibacillosis is a problem mainly of young flocks where mortality rates of 0.5 to 4% per week starting shortly after housing can occur. It is felt that this condition is most often secondary to upper respiratory challenges with Mg, *Mycoplasma synoviae* (Ms), ammonia, infectious bronchitis (IB), etc. It also may be a primary problem if water lines are contaminated with *E. coli*. The overall incidence of early onset colibacillosis

continues on the downward trend. A post-molt colibacillosis syndrome is also seen in some flocks due to declining immune system function, an ascending infection of the reproductive tract, upper respiratory infections, etc. The live *E. coli* vaccine, introduced in mid to late 2006, has been increasingly successful as both a preventative and a treatment in the face of an outbreak in most areas.

Calcium depletion is normally associated with low intake of calcium, phosphorus, and/or vitamin D3, especially early in production with low feed intakes. This condition will be an ongoing issue with increasingly higher egg production rates through improvements in management and genetics.

An external parasite, the Northern Fowl Mite, has risen to prominence in cage layers in past years' surveys. The difficulty in treating this condition, in cages and in cage-free flocks, has likely led to this increase. Spray treatment of caged layers is difficult due to the configuration of equipment. Elemental sulfur in dust baths is being used very successfully in cage-free flocks. Feeding of elemental sulfur will aid in reducing numbers of mites on birds as well. Decontamination of pullet moving trucks and equipment may also be lacking especially if the equipment was used previously for mite-infested spent fowl movement.

Focal duodenal necrosis (FDN), felt to be due to *Clostridium colinum*, is an under-diagnosed problem. It is felt to be a widespread subclinical disease with lesions in the duodenum, and results in losses of egg weight gain and/or egg production depending on the severity of the infection. The antibiotics chlortetracycline or bacitracin are used successfully for treatment and/or prevention. Fermentation metabolite, probiotic, prebiotic, and botanical products are being evaluated for their usefulness in prevention of FDN.

Mycoplasma synoviae (Ms) is a very prevalent disease in multi-age complexes but has little significance in most cases due to its low pathogenicity.

Mycoplasma gallisepticum (Mg) continues as an issue in multi-aged facilities and is successfully controlled in most cases through vaccination. Each complex must customize its vaccination program to control the strain on the farm. Ts-11 and 6/85 live vaccines are used for controlling mild strains of Mg while F-strain live vaccine is being used to control more pathogenic strains. The live pox-vectored recombinant Mg vaccine is being used in a variety of situations and appears to be useful in low challenge situations. Vaccine failures with all vaccines are somewhat common and the unit must resort to medication programs using tylosin or tetracycline antibiotics. Some operators are now applying the F-strain vaccine by eyedrop in an effort to increase its efficacy.

Coccidiosis and necrotic enteritis continues as a problem in some caged pullet and layer units due to contamination of houses with coccidial oocysts from past outbreaks and delivery of these oocysts to the chickens in cages by feces-laden manure belts, fecal dust, flies, or beetles. Coccidiosis vaccination of caged or cage-free pullets has

met with challenges of high mortality due to poor uniformity of vaccine application and high litter moisture in cage-free housing.

Marek's Disease was mentioned in the survey as being a minor problem. A handful of outbreaks have been seen in PA and the Midwest and could mean a loss of effectiveness of the presently used HVT + Rispens vaccine. Improper vaccination administration and/or inadequate grow house cleaning and disinfection may also be the culprits. One major outbreak reported last year in the Midwest with losses up to 60% at sell-off continued this year but is being controlled by improved vaccination and sanitation. Cage-free pullets tend to have more Marek's Disease than caged pullets due to the inability to satisfactorily clean and disinfect some of the cage-free growing facilities.

Diseases under control and of low incidence are as follows: vaccinal infectious laryngotracheitis (vILT), IB, fowl coryza, and urolithiasis/gout. These diseases tend to be localized to a region or a farm. The pox-vectored recombinant ILT vaccine has been determined to not be a replacement for chick embryo origin (CEO) vaccines in high challenge areas. The HVT-vectored ILT vaccine continues to show good results in high challenge regions and should reduce the amount of CEO vaccine used in layer flocks that may spread to broilers. Fowl coryza is a regional disease (Maine, southern California, Florida, and south Texas) and is controlled well by the use of commercial bacterin. Gout is almost exclusively due to feeding of excess calcium to birds not yet sexually mature or feeding inadequate phosphorus to birds at any stage of life.

Diseases that are very rarely a problem for table egg layers are pox, Newcastle, infectious bursal disease, chick anemia virus, erysipelas, and fowl cholera. The very virulent IBD outbreaks (vvIBD) seen in northern California in Dec '08 and May '09 have not shown a recurrence.

The survey also asked about other issues and diseases of concern on a scale of 0 to 3 with 0 = no concern, 1 = some concern, 2 = moderate concern, and 3 = very high concern. The opinions of the 20 respondents are as follows:

Issue (20 respondents)	Average
Avian Influenza	1.55
Lack of Effective Treatments	2.15
SE and FDA Egg Safety Rule	2.55
<i>S. heidelberg</i> and Egg Safety Rule	2.45
Welfare in General	2.33
Beak Trimming	1.70
Disposal of Male Chicks	1.40
On-Farm Euthanasia	1.95
Molting of Layers	1.60
Banning of Cages	2.60
Supply of Useful Vaccines	1.20

Concern for *Salmonella enteritidis* (SE) and its consequences continues due to the ongoing possibility of human outbreaks as occurred with the egg recall involving two Iowa operations in August 2010. The Egg Safety Rule was implemented on July 9, 2010 for flocks over 50,000 layers. Flocks of between 3,000 and 50,000 joined the program on July 9, 2012. The inspections for these smaller units will begin in late 2012 or early 2013. Many of these smaller operations are felt to be unprepared for complying with the requirements of the program.

The FDA Egg Safety Program entails obtaining chicks from NPIP SE Clean breeders, rodent and fly monitoring and control programs, biosecurity, cleaning and disinfection of premises, training of persons involved, testing of manure samples at 14-16 weeks, 40 to 45 weeks, and 6 weeks after molt. If any of the manure tests are positive for SE, egg testing must take place. The producer funds all testing and compliance efforts. Laboratories have managed to gear up to handle the increased testing load this requires. Producers with a manure positive swab test are holding eggs from the market until after the test results of eggs are obtained. DNA-based tests are minimizing the time of testing from the formerly required 10 days for culture to as low as 27 hours with the new tests. There is no provision in the program for compensating a producer who has an egg-positive flock and does not have a pasteurization or hard-cooking plant that will take their eggs. Producers are greatly ramping up measures to reduce risk of SE infection by increased use of vaccines, intestinal health feed additives, rodent and fly control measures, and biosecurity practices intended by the plan.

The possible addition of *Salmonella heidelberg* (SH) to the FDA Egg Safety Plan has the industry questioning why and how this will be initiated. SH in humans has not recently been attributed to eggs and the prevalence of SH in humans has dropped since the late 1990's to 2011 from 1 per 100,000 population to 0.35 per 100,000 in CDC figures from FoodNet. Also, there is no breeder program as there is for SE; it may take five to 10 years before one can be fully assured of a clean product once a breeder program is started. It is estimated that a much higher contamination rate of flocks with SH is present compared to SE, which has been reduced to 2% to 6% at present with the pressure of state and federal programs. (A phone conference call held in the USAHA Salmonella Committee meeting after this presentation with Dr. Gerry Ramirez of FDA revealed that FDA does not intend to add SH to the FDA Egg Safety Rule, nor will FDA purposely look for it during investigations).

Poultry welfare concerns continue to be of high to very high concern due to continued activities by activist groups. A surprising event occurred last year as the United Egg Producers (UEP) and the Humane Society of the United States (HSUS) agreed to work together to establish federal legislation to require an eventual switch from conventional cage systems to enriched cage systems by 2029. This should lead to the use of enriched cages in California, where the issue of which type of system would be approved according to the Prop 2 ballot initiative was undecided. This agreement also negated the ballot initiatives that were planned by HSUS in Washington and Oregon. This agreement was attached to the 2012 Farm Bill as an amendment to the Egg

Products Inspection Act. The 2012 Farm Bill has yet to be passed as of October 2012. If not passed, the agreement will be extended until the next Farm Bill is passed.

The lack of effective treatments for diseases such as colibacillosis, necrotic enteritis, ascarids, *Capillaria spp.*, fowl cholera, etc. is a very high concern and a welfare issue since the diseases can cause much suffering. The list of antibiotics that can be used in egg layers is quite short – bacitracin, tylosin, and chlortetracycline. The lack of an anti-parasitic product for controlling ascarids during lay, or other nematodes, is especially troublesome as these conditions are becoming increasingly common in cage-free production. Amprolium continues to be available to prevent and treat coccidiosis. Also, there is an increase in use of non-antibiotic, preventative feed and water additives containing probiotics, prebiotics and fermentation metabolites.

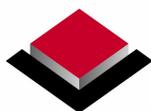
AI has fallen from very high concern to a high concern. Active and passive surveillance programs continue across the US in response to the threat of high pathogenic H5N1 AI (HPAI) from Asia. There is great concern in the layer industry about the amount of time before egg movement can take place once quarantine is placed on a premise in a control zone. As a result, the industry and USDA have developed the Secure Egg Supply (SES) Plan that would allow movement of product within 48 hours after quarantine. This is done by assuring that a farm: 1) has good biosecurity practices by being pre-approved, and; 2) is negative for AI by: a) testing five dead birds per house by AI real time PCR, and; b) reporting daily mortality and egg production to the authorities. Discussion and research on the best methods of bird euthanasia and disposal from large cage layer houses and complexes continues. The threat of H5 or H7 low pathogenic AI (LPAI) for layer flocks on the East Coast is much reduced due to the efforts by New York and New Jersey Departments of Agriculture and USDA to reduce the positivity of the live bird markets from 60% positive markets in 2004 to near 0 since. No significant AI isolations have been made in layer flocks in the US in the last year. A majority of egg operations are complying with the National Poultry Improvement Plan (NPIP) low pathogenic AI (LPAI) program for commercial layers.

Vaccine use continues to be the mainstay of disease prevention in the egg layer industry, second to biosecurity. The supply of useful vaccines continues to be quite adequate and appears to be keeping up with the layer industry needs. It will be interesting to see if this good supply of vaccines continues with the consolidations now occurring in the poultry vaccine business.

This year is the first year that the AVEP members were asked for their ideas as to research needs for the layer industry. A summary of the responses of the 15 members is as follows:

Research Need Area	Number of Respondents
1- <i>S. heidelberg</i> research	9
2-Increased supply of recombinant vaccines	4
3-Marek's Disease	4
4-Focal Duodenal Necrosis	3
5-Coccidiosis and necrotic enteritis	3
6-Calcium depletion	2
7-Comparison of cage systems/cage density	2
8-Tapeworms	1
9- <i>M. gallisepticum</i>	1
10-Colibacillosis	1
11-Significance of oral ulcers	1
12-Interference of feed additives with live <i>S. typhimurium</i> vaccines	1
13-Mite control	1
14-Reducing cannibalism	1
15-Reducing piling in cage-free flocks	1
16-Increasing treatment options for organic and conventional flocks	1
17-Additional methionine sources for organic flocks	1
18-Ammonia control products	1
19-vvIBD in California	1
Total respondents	15

The egg industry has experienced lower profits this year compared to last year. Feed price increases due to increases in corn prices resulting from the drought have hurt profits significantly. Egg price increases were seen this summer due to losses of birds due to heat (approximately 3% of the nation's flock) plus losses of production and egg size. In addition, exports of eggs to Mexico due to their losses of birds from H7N3 HPAI led to a short-lived increase in egg prices. Iowa (50.8 million) continues to be the lead state in egg production followed by Ohio (26.3 million), Indiana (23.6 million), Pennsylvania (22.5 million), and California (19.2 million), according to the National Agricultural Statistics Service for September 2012.



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