

HPAI Virus Elimination: Per-Square-Foot Flat Rates for Floor-Raised Poultry

Introduction

When a poultry facility becomes infected with avian influenza, virus elimination is a crucial step in the recovery process. The cleaning and disinfection practices used to achieve virus elimination should be cost effective (APHIS Highly Pathogenic Avian Influenza Red Book). During past highly pathogenic avian influenza (HPAI) outbreaks, reimbursable payments for virus elimination activities were, at times, delayed by the necessary paperwork for cooperative compliance agreements (CCAs). These agreements allowed premise owners and contractors to be reimbursed for completed work. In January, 2016, the Agency issued a flat rate payment on a per-bird basis for HPAI virus elimination activities to help streamline the process. Separate per-bird virus elimination flat rates were released for floor-raised turkeys and broilers to account for differences in bird density. Payments were made in two installments to help get funds to producers more quickly.

Since then, APHIS has continued to reevaluate the per-bird virus elimination flat rates to make cost-effective improvements while maintaining a fiscal awareness to the taxpayer. Stakeholders have also expressed an interest in the production types for which flat rates will be maintained and how those flat rates will be developed and updated. For these reasons, APHIS has revised the virus elimination flat rate for floor-raised poultry. The majority of meat birds, both turkey and broiler, are floor-raised. Therefore, this evaluation gave first priority to developing a VE flat rate for floor-raised poultry paid on a square-foot basis.

What costs were included in calculating the flat rates for floor-raised birds?

The four major items and activities that are funded in HPAI response efforts are: (1) bird and egg indemnity, (2) depopulation and disposal, (3) materials destroyed, and (4) virus elimination. The decision to clean and disinfect or destroy an item is made on a case-by-case basis for certain materials. The revised virus elimination flat rate is a single flat rate for all floor-raised meat birds on a square-foot basis that still covers labor, equipment and supplies to clean and disinfect the interior of barns, equipment, and materials. This approach includes items that would cost more to clean than they are worth, however for materials that cannot be safely or adequately cleaned the fair market value of disposed items is paid separately.¹

Traditionally, cleaning followed by application of a wet disinfectant has been used for virus elimination on HPAI infected premises. In the 2014-2015 outbreak, APHIS found that in many instances dry cleaning and heating barns was the most cost- and time-effective virus elimination method. Since the presence of organic material reduces the effectiveness of chemical disinfectants; the use of chemical disinfection requires a thorough wet cleaning phase in the barn. This wet cleaning phase has historically resulted in increased costs and delays in completion of virus elimination due to increased time and labor to remove soil, apply multiple detergents, rinse, and disinfectant applications, large amounts of liquid and solid waste, and the requirement for the barns to dry out completely prior to the

¹ https://www.aphis.usda.gov/publications/animal_health/2016/hpai-indemnity.pdf

application of the chemical disinfectant. In addition, damp environments support the continued viability of the virus which adds additional risk for spread. Heat disinfection penetrates remaining organic matter after dry cleaning, eliminating the need for wet cleaning and immediately removes one environmental factor required for virus viability. Therefore, heat disinfection and specific related activities are still used to calculate the virus elimination flat rate for floor-raised poultry. The flat rate virus elimination payment process allows the barn owner to select and implement the method that is most appropriate, as approved by State Animal Health Officials and APHIS.

Tables 1 through 4 outline the specific activities that are used in the calculation of VE flat rates for floor-raised poultry, and is based on the broad categories (i.e., barn preparation, dry cleaning, heat disinfection, equipment disinfection, wet cleaning, and other activities) listed in the “HPAI Virus Elimination: Flat Rate Payments” document². In addition, producers were more cost-efficient when doing virus elimination on their own farm in the 2015 HPAI outbreak as compared to contractors. Using the flat-rate approach recognizes cost-sharing by producers. The VE flat rate payment for floor raised poultry does not include routine or deferred maintenance and biosecurity activities that are part of that cost-share.

Table 1. Categories of barn preparation activities in the virus elimination flat rate for floor-raised poultry and parties responsible.

Categories of activities	Activities covered-Federal	Industry/grower cost-share
Barn preparation		
Labor	Disassembly and reassembly of: <ul style="list-style-type: none"> • Feeders • Drinkers • Fans (when cannot stay in the barn and be heat disinfected) • Heaters (when cannot stay in the barn and be heat disinfected) • Other cleanable equipment Equipment operator time Supervisor time	<ul style="list-style-type: none"> • Mowing around barns • Barn repairs, such as screens or holes in barn walls • Other routine maintenance
Equipment	Equipment to move items listed above, including trucks and trailers to haul equipment, fuel, and machinery	<ul style="list-style-type: none"> • Mowers • Herbicide sprayers
Supplies	Worker safety supplies: <ul style="list-style-type: none"> • Personal protective equipment (PPE) • Dumpster for disposal of PPE 	<ul style="list-style-type: none"> • Screens • Herbicide or rodenticide

Table 2. Categories of dry cleaning activities in the virus elimination flat rate for floor-raised poultry and parties responsible.

Categories of activities	Activities covered-Federal	Industry/grower cost-share
Dry cleaning (removing organic material in barn interior after disposal efforts, including vacant barns and feed storage facilities)		
Labor	Cleaning of: <ul style="list-style-type: none"> • Feeders 	Cleaning of: <ul style="list-style-type: none"> • Control room

² https://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/hpai_flat_rate.pdf

Categories of activities	Activities covered-Federal	Industry/grower cost-share
Dry cleaning (removing organic material in barn interior after disposal efforts, including vacant barns and feed storage facilities)		
	<ul style="list-style-type: none"> • Drinkers • Fans (when cannot stay in the barn and be heat disinfected). • Heaters (when cannot stay in the barn and be heat disinfected) • Other cleanable equipment Dusting of barn interior spaces that house or have direct contact with poultry or poultry products Equipment operator time Supervisor time	<ul style="list-style-type: none"> • Break room • Locker room • Office • Hallway
Equipment	Equipment to dry clean barn interior spaces that house or have direct contact with poultry or poultry products, including trucks and trailers to haul equipment, fuel, and machinery	<ul style="list-style-type: none"> • Trucks and ATVs for site supervisors • Portable toilets
Supplies	Worker safety supplies: <ul style="list-style-type: none"> • Personal protective equipment (PPE) • Dumpster for disposal of PPE and supplies used in dry cleaning 	<ul style="list-style-type: none"> • Meals for workers • Utilities (keeping the lights on while dry cleaning)

Table 3. Categories of disinfection activities in the virus elimination flat rate for floor-raised poultry and parties responsible.

Categories of activities	Activities covered-Federal	Industry/grower cost-share
Heat disinfection of barns (heat barns to between 100° F and 120° F for 7 days, with at least three of those days being consecutive)		
Labor	Time to: <ul style="list-style-type: none"> • Set up heaters • Monitor heating • Record temperatures Equipment operator time Supervisor time Electrician time to reroute existing heaters OR technician time to set up external heaters	
Equipment	Equipment to heat disinfect barns, including trucks and trailers to haul equipment, fuel, and machinery	<ul style="list-style-type: none"> • Trucks and ATVs for site supervisors
Supplies	Supplies needed to heat disinfect barns	
Utilities	Utilities to run heaters and fuel for heaters	
Decontamination of equipment		
Labor	Wash and disinfect: <ul style="list-style-type: none"> • Feeders • Drinkers • Fans (when cannot stay in the barn and be heat disinfected) • Heaters (when cannot stay in the barn and be heat disinfected) • All equipment listed for dry cleaning • Other cleanable equipment 	

Categories of activities	Activities covered-Federal	Industry/grower cost-share
	Equipment operator time Supervisor time	
Equipment	Equipment to decontaminate equipment listed above, including trucks and trailers to haul equipment, fuel, and machinery	<ul style="list-style-type: none"> Trucks and ATVs for site supervisors
Supplies	Worker safety supplies: <ul style="list-style-type: none"> Personal protective equipment (PPE) Dumpster for disposal of PPE and supplies used in disinfecting equipment Water and approved detergent/disinfectant for decontaminating equipment	<ul style="list-style-type: none"> Sawdust

Table 4. Categories of additional activities that may be in the industry/grower cost-share in the virus elimination flat rate for floor-raised poultry.

Categories of activities	Industry/grower cost-share
Wet cleaning and disinfection of barns	
Labor	Washing and disinfecting: <ul style="list-style-type: none"> Light bulbs Ledges Eaves Other interior barn surfaces Exterior of barn Application of insecticide/rodenticide
Equipment	Equipment for wet cleaning and disinfection
Supplies	Supplies for wet cleaning and disinfection
Other activities	
Admin/ Bookkeeping	<ul style="list-style-type: none"> Clerical and accountant time Mileage to meetings Legal counsel to review documents Time spent at meetings
Restocking preparation (Labor, equipment, and supplies)	<ul style="list-style-type: none"> Purchase of bedding Labor and equipment to spread bedding in house Any other activities related to restocking preparation after final environmental testing has occurred

How did USDA-APHIS-VS analyze virus elimination data from 2015 HPAI outbreak to estimate the flat rates for floor-raised poultry?

Over the course of the 2015 HPAI outbreak, cleaning and disinfection (C&D) of barn interiors on affected premises shifted from wet cleaning and chemical disinfection procedures to less time-intensive and more cost-effective methods. The presence of organic material reduces the effectiveness of chemical disinfectants. Heat disinfection penetrates remaining organic matter after dry cleaning, eliminating the need for wet cleaning and saving time and money in completion of virus elimination. Data on the costs of these C&D activities were collected from farmer-reported expenditures on commercial turkey farms under CCAs. These expenditures were collected from producers who performed all VE activities themselves during the 2015 outbreak in Iowa, Minnesota, Missouri, South Dakota, and Wisconsin in turkey finishing barns that ranged from 30,000 to 50,000 square feet and

brooder barns that ranged from 10,000 to 30,000 square feet. The CCAs provided by these farms were a detailed source of information. Financial plans typically included information on the costs by barn and barn size or included information with which to estimate an average cost per barn and average barn size. CCAs included the detailed labor, equipment and supplies typically used to perform VE activities as outlined in Tables 1 to 4.

Many turkey farms in the Midwest that used heat disinfection in the 2015 HPAI outbreak did not report the rental of external heating units in the CCA financial plans. Instead, many of those farms reported electrician time to convert or modify heaters in barns. However, not all farms or conditions may allow for that capability going forward. Therefore, the VE flat rates used estimates of heating cost from layer barns that underwent VE in the 2015 HPAI outbreak, including the rental of external heater units, mobilization of units to and from the farm, service technicians, and installation activities to supplement the barn preparation, dry cleaning, heating fuel, and barn temperature monitoring costs reported by turkey farms.

USDA-APHIS-VS analyzed the data from the 2015 HPAI outbreak CCAs to calculate the VE per-square-foot flat rates for floor-raised poultry for use in future outbreaks. Supplemental data on rate inflation factors, personal protective equipment used, and heat disinfection personnel, equipment, and supplies used were also collected as described below. Farm-level response cost data used in this analysis did not include indemnity, USDA-APHIS-VS personnel, supplies, or overhead. Contractor fees were also not included. The consumer price index reported from the Bureau of Labor Statistics was used to inflate all wages, equipment rental rates, and supply costs to 2017 dollars.

The personal protective equipment (PPE) needed to perform VE activities was drawn from the PPE usage across USDA-APHIS-VS in the 2014-2015 HPAI outbreak using data on actual shipments of PPE to command centers and personnel performing tasks on site. PPE includes coveralls, gloves, boot covers, a cap or hood, and a respirator. We estimate that each responder changed out PPE once every 3 hours and that a suit of PPE cost approximately \$5/PPE suit. This estimate was used to ensure that the flat rate is adequately funded to protect the health and safety of producer employees and supervisors performing VE activities.

The median poultry worker wage reported in the 2015 HPAI outbreak CCAs for all virus elimination activities was \$26/hour for all personnel types. Supervisor wages were only broken out from other workers' wages in one instance (\$30/hour supervisor wage). For supervisors, a higher hourly wage may reflect a higher level of oversight needed for virus elimination. So the median observed wage of \$26.62/hour (inflated to 2017 dollars) was used for supervisor time. For other poultry workers it was determined that the median wage of \$26.62 for virus elimination activities, while perhaps appropriate for other types of activities, was too high for VE activities that closely reflect the kind of barn cleaning activities required in normal business. The 2011 Economic Research Services Agricultural Resource Management Survey (ERS-ARMS) of Broilers included regional wage variation, and was used to set other poultry work wages. The regional poultry worker wages from that ERS-ARMS survey varied from \$8.27/hour to \$11.25/hour in 2011, which was \$8.97/hour to \$12.21/hour when inflated to 2017 dollars. The general hourly poultry worker wage used in the VE flat rate for floor-raised birds in the representative budget (applicable for activities like dry cleaning, monitoring barn temperatures, etc.) were was set to the maximum hourly regional wage reported or \$12.21/hour to reflect a single national wage that is appropriate for all regions.

How are flat rates calculated for floor-raised poultry?

The median³ rates of usage by activity was calculated across turkey finishing barns sized 30,000 square feet to 50,000 square feet and turkey brooder barns sized 10,000 square feet to 30,000 square feet. These represented the most common sizes of turkey finishing and turkey brooder barns, respectively. To calculate the flat rates, we estimated the median rates of usage on personnel, equipment, and supplies per barn.

Median costs per hour (personnel and equipment) or costs per unit (supplies) were inflated to 2017 dollars to obtain a cost for each activity per barn. The hourly wage used for poultry workers was set to the maximum hourly wage reported in the 2011 ERS-ARMS survey, inflated to 2017 dollars. In addition, every personnel wage was calculated using a multiplier of 1.5 from the base wage to give producers the funds to cover their poultry worker costs (including wages, unemployment insurance, taxes, other benefits, and possible overtime pay).

The median activity usage was multiplied by the median cost to get a total cost for each activity. These activity totals were summed per barn to get a total barn cost and divided by the average barn size to get a VE cost per square foot. Recognizing that some variability in activities occurs, the calculated VE cost per square foot was rounded up to the next nickel to account for moderate variations in virus elimination costs. Table 5 lists the budget of activities.

Since USDA-APHIS-VS determined dry cleaning and heating to be the most cost-effective VE method, we used that as the basis for the floor-raised poultry VE flat rate calculation. Producers have the responsibility of conducting or contracting some or all activities for successful virus elimination and may choose to use any effective VE method with the funds provided. These activities represent the requirements for successful VE in the 2014-2015 HPAI outbreak. Because there are no VE activities associated with lying fallow, producers who choose this approach rather than cleaning to eliminate virus are not offered funding.

³ In this set of barns, the mean and median personnel wage rates, equipment rental rates and supply costs were similar. We selected the median as a summary statistic across observations to provide the best representation of central tendency.

Table 5. Representative budget used to estimate a per-square-foot flat rate for floor-raised poultry for virus elimination in a representative 35,000 square-foot barn

Virus Elimination Activities	Description of the Activity	Use	Unit	Rate (\$/unit)	Total (\$)
Barn preparation					
Personnel					
Poultry worker	disassembly/reassembly of feeders, drinkers, fans, heaters, and other cleanable equipment	14	hr	\$18	252
Supervisor	All barn prep activities	1	hr	\$27	\$27
Equipment					
Skid steer /1	50 hp	1	hr	\$113	\$113
Supplies					
PPE	Personnel Protective Equipment	5	suits	\$6	\$28
Dry cleaning					
Personnel					
Poultry Worker	All dry cleaning activities	225	hr	\$18	\$4,050
Supervisor	All dry cleaning activities	2	hr	\$27	\$54
Equipment					
Pay loader /1	150 hp	4	hr	\$154	\$616
Skid steer /1	50 hp	3	hr	\$113	\$339
Tractor /1	150 hp, with rotary broom attachment & box blade attachment	2	hr	\$134	\$268
Blower /2	backpack blower	6	hr	\$62	\$372
air compressor /2	100 psi	5	hr	\$72	\$324
Lifts /1	All types	3	hr	\$88	\$220
Supplies					
PPE	Personnel protective equipment	75	suits	\$6	\$450
Dumpster	All dry cleaning activities	1	dumpster	\$308	\$308
Wet cleaning of equipment that will not be heat-disinfected					
Personnel					
Poultry Worker	All washing and disinfection of drinkers, feeders and equipment	71	hr	\$18	\$1,278

Virus Elimination Activities	Description of the Activity	Use	Unit	Rate (\$/unit)	Total (\$)
Supervisor	All washing and disinfection of drinkers, feeders and equipment	2	hr	\$27	\$54
Equipment					
Pressure washer/1	PTO-powered for drinkers, feeders and equipment	9	hr	\$124	\$1,116
tractor/1	for PTO-powered equipment	9	hr	\$103	\$927
water trailer /2	1,000 to 1,500 gallon	8	hr	\$47	\$376
Supplies					
Disinfectant	Virkon	7	tubs	\$64	\$448
Detergent	For cleaning equipment	1	Tub	\$36	\$36
PPE	Personnel protective equipment	24	suits	\$6	\$142
Water system cleaner	Cid 2000	10	gal	\$30	\$300
Heat Disinfection					
Personnel					
Poultry worker	monitor temperatures	14	hr	\$18	\$252
Poultry worker	installation	40	hr	\$18	\$720
specialized labor	service technician	1	per barn	\$642	\$642
Equipment					
Heaters	1 million BTU per barn	2	heaters	\$2,210	\$4,420
Ducting	ducting	1	per barn	\$185	\$185
Mobilization	mobilization-in and out	1	per barn	\$2,310	\$2,310
Supplies					
Fuel	Fuel for heaters	0.06	gal/sq ft	\$1	\$1,959

1/ Equipment rates (\$/hr) include equipment, mobilization, operator, and fuel cost.

2/ Equipment rates (\$/hr) include the equipment and mobilization cost.

How much will USDA-APHIS-VS pay for the flat rates for floor-raised birds and how is it paid?

The per-square-foot virus elimination flat rates for floor-raised poultry is \$0.65 per square foot. USDA-APHIS-VS makes two payments directly to the producer/owner, each for 50 percent of the total calculated value. Producers/owners may request the initial payment via a VS 1-23 form and would be paid after the flock plan is completed. A (second) final VS 1-23 is signed and paid after laboratory testing of environmental samples is completed with negative results reported. USDA-APHIS-VS will continue to provide oversight to meet our responsibility of ensuring that the HPAI virus is quickly contained and fully eliminated.

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