



December 5, 2017

**Re: Docket ID No. FSIS-2017-0045, National Chicken Council Petition on the Max Line Speed Rates for Young Chicken Slaughter Establishments Under New Poultry Inspection System and Salmonella Initiative**

Dear Acting Deputy Secretary Rottenberg:

On behalf of our over 10 million supporters and members, Mercy For Animals (MFA)<sup>1</sup> and the Humane Society of the United States (HSUS)<sup>2</sup> submit this comment in opposition to Petition No. 17-05 submitted by the National Chicken Council (NCC).<sup>3</sup> We urge you to immediately deny NCC's dangerous proposal to remove line speed limitations and allow chicken slaughterhouses to operate at whichever line speeds they choose. The proposed action lacks any rational legal or policy justification and would unjustifiably increase risks of food safety, inhumane treatment of poultry, and slaughterhouse worker injury.

As discussed in further detail below, FSIS should deny NCC's petition for two reasons:

---

<sup>1</sup> Mercy For Animals is a leading international animal protection charity dedicated to preventing cruelty to farmed animals and promoting compassionate food choices and policies. MFA represents more than 2.5 million members and supporters who are concerned about the welfare of chickens slaughtered for food, the safety of poultry meat produced and consumed in the U.S., and the safety of workers in poultry slaughterhouses.

<sup>2</sup> As the nation's largest animal protection organization, and on behalf of its millions of members and supporters, HSUS seeks a humane world for people and animals alike. HSUS drives transformational change in the U.S. and around the world by combating large-scale cruelties such as puppy mills, animal fighting, factory farming, seal slaughter, horse cruelty, captive hunts, and the wildlife trade. HSUS advocates against unsustainable agricultural practices and the inhumane treatment of birds and other animals raised for food.

<sup>3</sup> Before FSIS opened this docket for public comment on NCC's petition, we—along with the Animal Welfare Institute, American Society for the Prevention of Cruelty to Animals, Farm Forward, Animal Legal Defense Fund, and Compassion Over Killing—submitted a comment requesting that FSIS deny NCC's petition or, alternatively, consider the petition through public notice and comment rulemaking pursuant to 5 U.S.C. § 553(b). We hereby incorporate by reference our previous comment, including the supporting documentation submitted along with it. A copy of this earlier comment is attached hereto.

(1) The requested action is contrary to law. FSIS lacks statutory and regulatory authority to grant the petition; indeed, implementing the so-called waiver system as requested would violate the Poultry Products Inspection Act (PPIA) and FSIS's own regulations setting criteria for waivers. Further, contrary to NCC's claims, the requested action would not promote compliance with Executive Order 13771 and the White House's "Regulatory Reform Agenda."

(2) Granting the petition would be arbitrary and capricious because the proposed action is completely unsupported by the record before the agency; to the contrary, the record demonstrates that the requested action would undermine the PPIA's goal of protecting the safety and health of consumers and FSIS's regulation requiring poultry slaughterhouses to ensure worker safety.

Alternatively, if—despite the clear animal welfare, food safety, and worker injury risks—FSIS is nevertheless determined to continue its consideration of NCC's dangerous proposal, then it must conduct a proper environmental review pursuant to the National Environmental Policy Act. It must also comply with the Administrative Procedure Act (APA) and initiate notice-and-comment rulemaking.

Lastly, if FSIS is determined to grant NCC's petition (with proper procedures and adequate environmental review, as it must do), then FSIS should require that poultry slaughterhouses implement multi-stage controlled-atmosphere killing as a condition of participating in the "waiver system."

## **I. FSIS Should Deny NCC's Petition Because the Proposed Action Would Be Arbitrary, Capricious, and Contrary to Law**

It is axiomatic that agency decisions must not be "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."<sup>4</sup> The basic requirement of "reasoned decisionmaking"<sup>5</sup> requires that the agency decision be "based on consideration of the relevant factors, and within the scope of the authority delegated to the agency by the statute. ... [T]he agency must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made."<sup>6</sup>

---

<sup>4</sup> 5 U.S.C. § 706(2)(A).

<sup>5</sup> *Allentown Mack Sales & Service, Inc. v. NLRB*, 522 U.S. 359, 374 (1998).

<sup>6</sup> *Motor Vehicle Mfrs. Ass'n of the U.S. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 42–43 (1983).

FSIS should deny NCC's petition for "a waiver system pursuant to 9 C.F.R. § 381.3(b)"<sup>7</sup> for two reasons. First, the requested action would be contrary to law because it would violate the PPIA and FSIS's waiver regulation. Second, the requested action would be arbitrary and capricious because the facts before the agency lack any "rational connection"<sup>8</sup> to it; on the contrary, the evidence in the record overwhelmingly demonstrates that granting NCC's petition would undermine the goals of the PPIA and the implementation of FSIS regulations and thus would be the opposite of reasoned decision making.

### **A. Granting NCC's Petition Would Be Contrary to Law**

NCC's profit-driven proposal, if implemented, would increase the risk of adulteration of poultry products and would likely violate the PPIA's requirement of individual carcass inspection. Further, the so-called waiver system is not authorized by FSIS's regulation for line speed waivers in poultry slaughter establishments—indeed, as explained below, what NCC seeks is not a waiver at all. Lastly, the requested action cannot be justified by the White House's Regulatory Reform Agenda and Executive Order 13771, contrary to NCC's claims.

#### **1. The Proposed Action Would Violate the PPIA**

FSIS should deny NCC's petition because the requested waiver system, if implemented, would violate the PPIA by increasing the risk that adulterated poultry products would be sold and by preventing FSIS from performing inspections of individual bird carcasses.

The purpose of the PPIA is to protect "the health and welfare of consumers ... by assuring that poultry products distributed to them are wholesome, not adulterated, and properly marked, labeled, and packaged."<sup>9</sup> The PPIA establishes national policy that the "inspection [and regulation] of poultry and poultry products" are necessary "to prevent the ... sale ... of poultry products which are adulterated or misbranded."<sup>10</sup> A poultry product is "adulterated" if (1) "it bears or contains any poisonous or deleterious substance which may render it injurious to health"; (2) "it consists in whole or in part of any filthy, putrid, or decomposed substance or is for any other reason unsound, unhealthful, unwholesome, or otherwise unfit for human food"; or (3) "it is, in whole or

---

<sup>7</sup> Petition No. 17-05 at 1.

<sup>8</sup> *State Farm*, 463 U.S. at 43.

<sup>9</sup> 21 U.S.C. § 451.

<sup>10</sup> *Id.* § 452.

in part, the product of any poultry which has died otherwise than by slaughter.”<sup>11</sup> FSIS has already recognized that “poultry products are more likely to be adulterated if ... they are produced from birds that have not been treated humanely, because such birds are more likely to be bruised or to die other than by slaughter.”<sup>12</sup>

If FSIS grants NCC’s petition, it will have to explain why removing slaughter line speed limits is consistent with the PPIA and reasoned decision making. As already demonstrated in our previous comment, NCC’s requested action would increase the risk that poultry meat would become adulterated from inhumane handling of chickens.<sup>13</sup> This is because fast line speeds are correlated with loss of process control that results in birds being intentionally mistreated by workers, improperly hung in shackles, insufficiently cut and bled, and scalded alive.<sup>14</sup> MFA has conducted more than 60 undercover investigations of factory farms and slaughterhouses, including seven investigations of poultry slaughter plants in North America. Each of these seven investigations have documented egregious cruelty to birds, the root cause of which is often the dangerously fast pace of slaughter—even under customary poultry slaughter practices and line speeds.<sup>15</sup> The HSUS has also conducted undercover investigations of

---

<sup>11</sup> *Id.* § 453.

<sup>12</sup> Notice, Treatment of Live Poultry Before Slaughter, 70 Fed. Reg. 56624, 56624 (Sept. 28, 2005).

<sup>13</sup> Comment submitted by MFA, et al. (Sept. 20, 2017), at 3–7.

<sup>14</sup> *Id.* Additionally, removing line speed limits will increase the incidence of live birds entering the scalding tank, which is a risk factor for fecal contamination. This is because birds who enter the scalding tank still alive will expel waste, which then covers the carcasses of other birds. USDA FSIS, Improvements for Poultry Slaughter Inspection Technical Report 7 (2008), [https://www.fsis.usda.gov/wps/wcm/connect/86695053-e060-4a56-81cd-90e4aa5440fe/Poultry\\_Slaughter\\_Tech\\_Report.pdf?MOD=AJPERES](https://www.fsis.usda.gov/wps/wcm/connect/86695053-e060-4a56-81cd-90e4aa5440fe/Poultry_Slaughter_Tech_Report.pdf?MOD=AJPERES) (“[C]ross-contamination can also occur during scalding from microorganisms present on the external and internal surfaces of the carcass and in the scalding water.”); Marc Linder, *I Gave My Employer a Chicken That Had No Bone: Joint Firm-State Responsibility for Line-Speed-Related Occupational Injuries*, 46 CASE WESTERN RESERVE L. REV. 33, 93 (1995) (describing incidence of live chickens entering the scalding tank expelling waste); GAIL EISNITZ, *SLAUGHTERHOUSE: THE SHOCKING STORY OF GREED, NEGLECT, AND INHUMANE TREATMENT INSIDE THE U.S. MEAT INDUSTRY* 167 (2007) (“In the scald tank, fecal contamination on skin and feathers gets inhaled by live birds.”).

<sup>15</sup> MFA’s investigations have documented chickens improperly hung in shackles, resulting in broken bones; live and conscious chickens being mutilated by the killing blade; and live and conscious chickens being scalded in the scalding tank. Additionally, every undercover investigation has documented frustrated workers tormenting and torturing live chickens by punching, throwing, or hitting them, and even ripping the heads off live birds. See, e.g., Mercy For Animals, *Tyson Tortures Animals* (May 24, 2016), <http://www.tysontorturesanimals.com/>; Mercy For Animals, *Tyson Caught on Hidden Camera Ripping Heads Off Live Animals* (Oct. 27, 2015), <https://www.youtube.com/watch?v=0L2mGC4zezM>; Mercy For Animals, *Shocking Animal*

poultry slaughterhouses and has documented similar conditions and egregious conduct.<sup>16</sup>

Since we submitted our previous comment, the Animal Welfare Institute released an update to its 2016 report *The Welfare of Birds at Slaughter*, which concludes that cruelty to birds, especially chickens, persists in many of the poultry slaughterhouses regulated by the USDA.<sup>17</sup> Based on FSIS's own inspection records from 2015 to 2016, AWI found the following:

- From 2015 to 2016, half of all poultry slaughterhouses inspected by the USDA received 500 citations concerning inhumane handling of birds, with four plants receiving more than 25 citations each—many of them repeat citations.<sup>18</sup>
- The most common violations were birds being scalded alive.<sup>19</sup> This is typically a line speed issue, because birds are scalded alive when they are improperly hung by workers struggling to keep up with the speed of the line, when they are not cut by the killing blade or the backup killer because the birds are moving too fast, and when the line cannot be stopped before they enter the scalding tank. A typical example: On June 13, 2016, Case Farms (P15724) was cited when “the

---

*Abuse Exposed at “American Humane Certified” Foster Farms Slaughterhouse* (June 17, 2015), <https://www.youtube.com/watch?v=vBZW2FKs8qs>; Mercy For Animals, *The Video the Poultry Industry Doesn’t Want You to See* (Mar. 14, 2015), <http://www.goryfoodservice.com/>; Mercy For Animals, *Chick-fil-A Suppliers Caught on Hidden-Camera Torturing Animals* (Nov. 19, 2014), <http://www.chickfilacruelty.com/>.

<sup>16</sup> The HSUS's investigations of chicken slaughterhouses have documented chickens punched, kicked, and violently slammed into shackles; chickens improperly hung in shackles; and chickens missing the cutting blade and entering the scalding tank fully alive and conscious. *See, e.g.,* HSUS, *Shocking Animal Abuse Uncovered at Country’s Second Largest Chicken Producer* (June 27, 2017), [http://www.humanesociety.org/news/press\\_releases/2017/06/Pilgrims-pride-shocking-animal-abuse-investigation-062716.html?referrer=https://www.google.com/](http://www.humanesociety.org/news/press_releases/2017/06/Pilgrims-pride-shocking-animal-abuse-investigation-062716.html?referrer=https://www.google.com/); HSUS, *Spent Hen Slaughter Exposé: Birds Abused and Scalded Alive* (Jan. 5, 2015), <https://www.youtube.com/watch?v=eM-JsyyfSmE>.

<sup>17</sup> Animal Welfare Institute, *The Welfare of Birds at Slaughter in the United States 2017 Update*, <https://awionline.org/sites/default/files/uploads/documents/FA-AWI-Welfare-of-Birds-at-Slaughter-Update.pdf>.

<sup>18</sup> AWI notes high variability in the number of poultry plants written up. Only FSIS can definitively explain the variability, though one possible explanation is that “the USDA has not provided AWI with all relevant records in response to its FOIA requests.” *Id.* at 4.

<sup>19</sup> *Id.* at 5.

back-up killer failed to cut the throats of no less than five birds. Personnel were unable to remove the birds before they entered the scald tank and drowned.”<sup>20</sup>

- Many violations are not documented. Because FSIS considers “Good Commercial Practices” to be a “process control issue,” only instances involving large numbers of birds are documented; thus, each of the incidents reported involved many birds, “in some cases hundreds, or even thousands.”<sup>21</sup> This means that there are many more incidents involving fewer birds that go undocumented and unabated.

Although FSIS purports to be committed to addressing the problem of inhumane handling and slaughter of animals,<sup>22</sup> undercover investigations and FSIS’s own inspection records demonstrate that current policy with respect to poultry slaughter is woefully inadequate to deter inhumane handling in poultry slaughterhouses and therefore inadequate to ensure that poultry products are not adulterated.<sup>23</sup> Given that process control failures, such as the examples above, are linked to fast line speeds,<sup>24</sup> FSIS will not be able to rationally explain how granting NCC’s petition would not exacerbate these food safety and animal welfare issues. If FSIS fails to address the connection between inhumane slaughter and food safety as it relates to the increase in the speed of the stunning and slaughter process, its decision to grant NCC’s petition would be extremely vulnerable to legal challenges.

---

<sup>20</sup> *Id.* at 8.

<sup>21</sup> *Id.* at 5.

<sup>22</sup> 70 Fed. Reg. 56624 (“FSIS considers humane methods of handling animals and humane slaughter operations a high priority and takes seriously any violations of applicable laws and regulations.”).

<sup>23</sup> *Id.* (“[U]nder the PPIA, poultry products are more likely to be adulterated if, among other circumstances, they are produced from birds that have not been treated humanely.”). *See also* FSIS PHIS Directive 6100.3: Ante-Mortem and Post-Mortem Poultry Inspection 3–6 (2011); FSIS Notice 44-16: Instructions for Writing Poultry Good Commercial Practices Noncompliance Records and Memorandum of Interview Letters for Poultry Mistreatment 1–3 (2016). We also incorporate by reference the arguments made by the HSUS in its comment submitted to FSIS on May 29, 2012 re. Docket ID No. FSIS-2011-0012, Modernization of Poultry Slaughter Inspection Rule, at pages 1–5, as NCC’s petition raises the same issues. The HSUS’s petition is attached hereto.

<sup>24</sup> As noted in our previous comment, a common corrective action taken in response to egregious process control failures resulting in cruel handling and slaughter of birds is to reduce the line speed. *See* Comment submitted by MFA, et al., at 5–6.

NCC's requested action would also likely violate the PPIA's requirement of individual carcass inspection.<sup>25</sup> To prevent adulterated food from being sold, the PPIA requires that FSIS inspectors inspect "the carcass of *each bird processed*."<sup>26</sup> "Inspection" means that the inspector gives a "critical determination whether [a carcass or part of a carcass] is adulterated or unadulterated."<sup>27</sup> The New Poultry Inspection System (NPIS), to which NCC's proposed action applies, is already on dubious legal footing with respect to this requirement because it decreases the number of line inspectors and shifts carcass sorting and some inspection duties to plant personnel.<sup>28</sup>

NCC's proposal to allow poultry slaughterhouses to operate at speeds in excess of 140 or 175 birds per minute (maximums that were determined in part based on FSIS's assertion that it could maintain proper inspection at these speeds) would necessarily make it extremely difficult, if not impossible, to inspect the carcass of each bird processed. Indeed, NCC's petition tellingly fails to explain how individual carcass inspection per section 455(b) could be performed at the faster line speeds at which poultry slaughterhouses would operate. NCC's petition also fails to mention that, under NPIS, there are fewer inspectors on the line to conduct carcass inspection and maintain process control. Therefore, it is unlikely that process control and adequate food safety inspection would be maintained and ensured under NCC's proposal to eliminate maximum line speeds. Notwithstanding NCC's silence on these issues, FSIS would be obligated to adequately address these statutory requirements, which it likely would not be able to do.

The requested action, if granted, would violate the most fundamental and important purposes of the PPIA: protecting consumers from adulterated meat and ensuring effective bird-by-bird inspection by qualified FSIS inspectors.

---

<sup>25</sup> This issue is also raised in the Comment Submitted by Food and Water Watch (Oct. 5, 2017) ([link](#)).

<sup>26</sup> 21 U.S.C. § 455(b).

<sup>27</sup> *Am. Federation of Gov't Employees v. Glickman*, 215 F.3d 7, 11 (D.C. Cir. 2000).

<sup>28</sup> See Complaint, *Food and Water Watch v. Vilsack*, No. 14-cv-1547 (KBJ) (Sept. 11, 2014) (challenging legality of NPIS Final Rule under the Administrative Procedures Act and the PPIA), *dismissed on standing grounds*, 808 F.3d 905 (D.C. Cir. 2015); see also *Am. Federation of Gov't Employees*, 215 F.3d at 11 (holding that "[d]elegating the task of inspecting carcasses to plant employees violates the clear mandates of the ... PPIA"). That a court has not yet reviewed the NPIS Final Rule is due solely to jurisdictional limitations and is not a judicial affirmation of NPIS. Indeed, if FSIS grants this petition, it would likely invite further litigation on the legality of NPIS and this so-called waiver system.

## 2. The Proposed Action Would Violate FSIS's Waiver Regulation

FSIS should also deny NCC's petition because it is clearly an attempt to bypass FSIS's rule on maximum line speeds. NCC disingenuously calls its proposal a "waiver," when it in no way complies with the requirements of FSIS's waiver regulation.<sup>29</sup>

FSIS regulations set maximum line speeds for poultry slaughterhouses, including the maximum line speed of 140 birds per minute for slaughterhouses that kill young chickens.<sup>30</sup> Waivers of any of the regulations under the PPIA are authorized only in limited circumstances and only when each of the following conditions are met: (1) the waiver is for specific classes of cases; (2) the waiver is for limited periods of time; (3) the waiver is necessary to address a public health emergency or "to permit experimentation so that new procedures, equipment, and processing techniques may be tested to facilitate definite improvements."<sup>31</sup> Additionally, granting the waiver cannot conflict with the PPIA.<sup>32</sup>

NCC's proposal cannot be granted pursuant to section 381.3(b) because it meets none of these conditions. The proposal defines no specific classes of cases and no limitation of time whatsoever. Rather, NCC is asking that any slaughterhouse that entered into the NPIS or the Salmonella Initiative Program (SIP) be allowed to "operate at any line speed at which they can maintain process control" for any length of time. Similarly, NCC utterly fails to identify any "definite improvements" resulting from "new procedures, equipment, and processing techniques" that would justify a true waiver under section 381.3(b). In fact, NCC's chief argument in its petition is that its proposal would not make food or worker safety *any worse*.<sup>33</sup> Not only is that argument hollow; it is likely false.

Other arguments NCC makes to support its proposal—to further increase profits and the volume of exports of the \$90 billion U.S. poultry industry<sup>34</sup>—are irrelevant to the PPIA, which says nothing about profits and expansion for the industry. NCC's desire to pad the pockets of its members simply does not justify the requested action, especially

---

<sup>29</sup> This issue is also raised by the comments submitted in this docket by the Southern Poverty Law Center ([link](#)) and by Food and Water Watch.

<sup>30</sup> Final Rule, New Poultry Inspection System, 79 Fed. Reg. 49635 (Aug. 21, 2014) (codified at 9 C.F.R. § 381.69).

<sup>31</sup> 9 C.F.R. 381.3(b).

<sup>32</sup> *Id.*

<sup>33</sup> See Comment Submitted by Food and Water Watch at 4; see also Petition 17-05 at 3–7, 9–11.

<sup>34</sup> See Petition 17-05 at 7–12.

in light of the danger to animals, workers, and food safety that the proposal would create.

In sum, NCC's petition fails to explain how its proposal complies with FSIS's regulation that allows for limited waivers in very specific instances. NCC cannot shoehorn what it really wants—a repeal of line speed maximums—into the waiver regulations.

### **3. The Requested Action Is Not Justified by the White House's Regulatory Reform Agenda**

NCC also attempts to justify its dangerous petition by appealing to the White House's Regulatory Reform Agenda, announced in Executive Order 13771, but this argument also fails. Executive Order 13771 set forth a policy that agencies "be prudent and financially responsible in the expenditure of funds, from both public and private sources"; that "for every one new regulation issued, at least two prior regulations be identified for elimination"; and that agencies budget the costs of new and repealed regulations.<sup>35</sup>

Aside from an oblique reference that "'one time' regulatory actions (i.e., those actions that are not periodic in nature) that expand consumption and/or production options would qualify as EO 13771 deregulatory actions," NCC's petition identifies no clear cost-saving benefits or decrease in FSIS's administrative burden if its proposal were granted. Rather than a "one time" action, the creation of the so-called waiver system would create an ongoing burden on FSIS to accept slaughterhouses into the program and determine at which line speed(s) they plan to operate and whether they can maintain process control at those speeds—completely in the absence of FSIS testing and experience (which at least exists under current line speeds). Thus, contrary to NCC's claims, the proposed action would likely *increase* the financial and administrative burdens on the agency. Glaringly absent from NCC's petition is any explanation of how the administration of the requested action would be cost-effective or even financially neutral to FSIS. Therefore, FSIS will likely be unable to rationally explain how the requested action would reduce burdens on the agency.

FSIS has recently, and repeatedly, recognized that rules that create inefficiencies for FSIS inspectors are rules that should be changed on that basis.<sup>36</sup> For example, when

---

<sup>35</sup> Executive Order, 82 Fed. Reg. 9339 (Jan. 30, 2017).

<sup>36</sup> See Requirements for the Disposition of Non-Ambulatory Disabled Veal Calves, 80 Fed. Reg. 27,269, 27,271 (May 13, 2015) (issuing rule because it will "ensure more effective and efficient implementation of inspection procedures and compliance with humane handling requirements

promulgating regulations for the disposition of non-ambulatory disabled cattle, including veal calves, FSIS recognized that setting policies that ensure better animal handling practices promoted not only regulatory compliance but more effective and efficient inspection. Similarly, setting policy for poultry slaughter that promotes better animal handling practices would further compliance with the PPIA and ensure more effective and efficient inspections. The very opposite would happen if FSIS were to grant NCC's petition to speed up poultry slaughter lines. Not only would this action eviscerate the existing line speed rule (which FSIS has determined would improve compliance with the PPIA and effectiveness of poultry slaughter inspection<sup>37</sup>); FSIS would actually *increase* its regulatory burden and *decrease* compliance. An agency's action is arbitrary when similar situations are treated differently without reasoned justification.<sup>38</sup>

Further, as discussed above and in our prior comment, not to mention in many of the comments submitted in opposition to this petition,<sup>39</sup> granting NCC's proposal would likely shift many costs onto the public. There would be costs associated with the increased food safety risks because, as explained, faster line speeds would lead to greater risk of process control loss and greater likelihood that unwholesome and adulterated meat would be sold. The USDA estimates that foodborne illnesses already cost \$15.6 billion each year,<sup>40</sup> and poultry products in particular are responsible for the deadliest outbreaks.<sup>41</sup> Moreover, workers who are injured, disfigured, or disabled due to unsafe working conditions often require extensive medical care. Since their employers (whom NCC represents) often refuse to provide or pay for such

---

at official veal slaughter establishments"); Requirements for the Disposition of Cattle that Become Non-Ambulatory Disabled Following Ante-Mortem Inspection, 74 Fed. Reg. 11,463, 11,463-64 (Mar. 18, 2009) (issuing rule because it will ensure better humane handling practices, and will foster more efficient procedures).

<sup>37</sup> 79 Fed. Reg. 49635.

<sup>38</sup> See, e.g., *Ashkar v. Burzynski*, 384 F.3d 11923, 1998 (9th Cir. 2004); *SKF USA Inc. v. United States*, 263 F.3d 1369, 1382 (Fed. Cir. 2001).

<sup>39</sup> See Comment Submitted by Southern Poverty Law Center; Comment Submitted by Food and Water Watch; Comment Submitted by United Food and Commercial Workers Union (Oct. 10, 2017) ([link](#)); Comment Submitted by In Defense of Animals (Oct. 30, 2017) ([link](#)), Comment Submitted by Citizens Action Coalition Education Fund and Indiana Public Health Association (Nov. 1, 2017) ([link](#)).

<sup>40</sup> Centers for Disease Control and Prevention, CDC and Food Safety, <https://www.cdc.gov/foodsafety/cdc-and-food-safety.html> (last visited Nov. 21, 2017).

<sup>41</sup> Centers for Disease Control and Prevention, Attribution of Foodborne Illnesses: Findings, <https://www.cdc.gov/foodborneburden/attribution/attribution-1998-2008.html> (last visited Nov. 21, 2017).

care,<sup>42</sup> injured workers are often forced to rely on social welfare services when available. An increase in slaughter line injuries would likely increase reliance on social welfare.

Lastly, the Final Guidance Memorandum for implementing Executive Order 13771 makes clear that “agencies are still required to comply with their statutory obligations.”<sup>43</sup> As discussed above, granting NCC’s petition would violate FSIS’s statutory obligations under the PPIA.

Far from reducing costs or promoting deregulation as intended by Executive Order 13771, NCC’s proposed action would instead impose great regulatory burdens on FSIS and increase costs to workers, consumers, and taxpayers. FSIS must deny NCC’s petition because the requested action is not authorized by law—not by the PPIA, not by FSIS’s regulation for waivers, and not by Executive Order 13771.

### **B. Granting NCC’s Petition Would Be Arbitrary and Capricious Because It Is Completely Unsupported by the Administrative Record**

Apart from the lack of legal authority, it would be arbitrary and capricious for FSIS to grant NCC’s petition because the record before the agency overwhelmingly demonstrates that NCC’s proposal is a dangerous and irrational policy choice. Agency action is arbitrary and capricious, and therefore will be set aside by a reviewing court, “if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.”<sup>44</sup>

NCC offers four policy reasons in support of its proposal: (1) the proposal would increase profits for the chicken industry; (2) it would boost U.S. exports of chicken; (3) it would not further jeopardize food safety than the status quo; and (4) it would not further jeopardize worker safety than the status quo. None of these reasons provide a rational basis for FSIS to grant the petition.

---

<sup>42</sup> See, e.g., Comment Submitted by SPLC and sources cited at *infra* note 64.

<sup>43</sup> M-17-21, Memorandum: Guidance implementing Executive Order 13771, titled Reducing Regulation and Controlling Regulatory Costs (Apr. 5, 2017), <https://www.whitehouse.gov/the-press-office/2017/04/05/memorandum-implementing-executive-order-13771-titled-reducing-regulation>.

<sup>44</sup> *State Farm*, 463 U.S. at 43.

The first two reasons simply cannot justify the proposed action because they are both “factors which Congress has not intended [FSIS] to consider.”<sup>45</sup> The sole purpose of the PPIA is to “protect the health and welfare of consumers”<sup>46</sup> by requiring FSIS to inspect and regulate the slaughter of poultry and the processing of poultry products to prevent adulterated or misbranded poultry meat products from being sold.<sup>47</sup> Nowhere in the PPIA is it determined to be Congress’s goal to increase the profits of the chicken industry<sup>48</sup> or to boost U.S. exports. Tellingly, NCC’s petition does not cite any provision of the PPIA to support these arguments. Therefore, these would be improper bases for granting NCC’s petition and it would be arbitrary and capricious for FSIS to do so.

The third and fourth reasons offered also fail to provide a reasoned basis for granting the petition. As a preliminary matter, even assuming for the sake of argument that NCC is correct that its proposal would not make food or worker safety any worse than the status quo (which is not true), this claim hardly explains how granting the proposal would actually further the purposes of the PPIA. Furthermore, FSIS cannot grant NCC’s petition based on these arguments because they lack factual support and are contradicted by the record before FSIS, as explained in greater detail below.

### **1. The Record Does Not Support NCC’s Assertion That Its Proposal Would Not Jeopardize Food Safety**

NCC’s petition provides only paltry and unreliable data to support its assertion that “increasing permissible line speeds would not impair food safety.”<sup>49</sup> NCC’s petition references a self-serving industry study — which is not part of the public record — comparing a total of 20 plants over a six-month period. No information is provided about how these plants were chosen, the methodology of the survey, or how the results are statistically sound or valid.<sup>50</sup> It goes without saying that a secret study conducted by a biased party is not a rational basis for an agency’s decision making.<sup>51</sup>

---

<sup>45</sup> *State Farm*, 463 U.S. at 43.

<sup>46</sup> 21 U.S.C. § 451 (Congressional statement of findings).

<sup>47</sup> *Id.* § 452 (Congressional declaration of policy).

<sup>48</sup> NCC’s petition speaks in terms of “cost efficiency,” Petition No. 17-05 at 7–8, which is merely a euphemism for increasing profits, but at any rate, reducing costs on the industry is not a goal of the PPIA either.

<sup>49</sup> Petition No. 17-05 at 3.

<sup>50</sup> See also Comment Submitted by Food and Water Watch at 7–8.

<sup>51</sup> At minimum, then, even if FSIS does not deny NCC’s petition outright (as it should), and if it relies at all on this survey while considering NCC’s petition, then it must provide this survey to the public for review and comment. See *United States v. Nova Scotia Food Products Corp.*, 568 F.2d 240, 248 (2d Cir. 1977) (“[F]ailure to disclose to interested persons the factual material upon

To the contrary, as established above, the record before the agency demonstrates that NCC's proposal would increase the risk of adulteration during poultry slaughter and impair inspectors' ability to inspect each carcass—contrary to FSIS's duty to “protect the health and welfare of consumers.”<sup>52</sup>

Lastly, FSIS cannot rely on the NCC's assertion that food safety could be protected because “establishments would have to be able to maintain process control at whatever line speed they select.”<sup>53</sup> NCC is asking for a blank check for slaughterhouses to operate at any line speeds they choose, in exchange for a cheap promise to maintain line speed control. In fact, the chicken industry has proved that it is utterly incapable of self-regulation.

For example, the following was written by a USDA inspector regarding a Simmons Prepared Foods plant, after an incident in which **358 chickens were scalded alive and drowned in the scalding tank**: “The establishment failed to comply with its Animal Welfare Program which states, as human beings it is their responsibility to ensure if an animal's life is to be taken, it is to be done with dignity and respect, making the death as painless and distress free as possible.”<sup>54</sup>

Clearly, the industry is unable to maintain process control even at current line speeds. It would therefore be unreasonable for FSIS to rely on NCC's self-serving assertion that process control failures and the resulting food safety risks would not be exacerbated by faster line speeds. To the contrary, FSIS will likely be unable to provide a reasoned explanation that granting NCC's proposal would not increase food safety risks.

## **2. The Record Does Not Support NCC's Assertion That Its Proposal Would Not Jeopardize Worker Safety**

NCC makes many sweeping, baseless claims about the poultry industry's improvements in worker safety but fails to provide reliable facts in support of its

---

which the agency was relying vitiates the element of fairness which is essential to any kind of administrative action.”).

<sup>52</sup> 21 U.S.C. § 451.

<sup>53</sup> Petition No. 17-05 at 7. This part of NCC's proposal is nothing more than false comfort, since all slaughterhouses are already required by regulation to maintain process control. 9 CFR § 381.65(g).

<sup>54</sup> AWI Poultry Report 2017 Update, *supra* note 17 at 6. Our earlier comment provided many more examples of process control failures related to fast line speeds under current limits.

claims. To the contrary, the evidence in the record demonstrates that the dangers inherent in poultry slaughterhouse work are exacerbated by faster line speeds.<sup>55</sup> In order to satisfy the requirement of reasoned decision making, if FSIS grants NCC's petition, it "must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made."<sup>56</sup> It cannot do so when there are so many holes in NCC's data.

NCC's claim that the decline in government records of worker illnesses and injuries proves that the poultry industry has greatly improved worker safety is undermined by the well-known fact that such incidents are vastly underreported.<sup>57</sup> The workplace injury form, which OSHA relies on to obtain workplace injury data, was changed in 2002—perhaps not coincidentally the same year OSHA formed an alliance with the American Meat Institute<sup>58</sup>—to require less reporting of musculoskeletal injuries. This change resulted in a significant drop in the reported injury rate in meat and poultry slaughterhouses.<sup>59</sup> According to a Government Accountability Office (GAO) report from last year, injury rates in the meat and poultry slaughter industries are still higher than the rates for any other manufacturing industry, and the data on injury and illness rates for the meat industry are unreliable "because of underreporting and inadequate

---

<sup>55</sup> Letter from John Howard, Director, NIOSH, to Alfred V. Almanza, Administrator, FSIS (Apr. 7, 2014), <https://www.cdc.gov/niosh/topics/poultry/pdfs/letterapril72014.pdf>.

<sup>56</sup> *State Farm*, 463 U.S. at 43.

<sup>57</sup> See Jessica G. Ramsey, et al., NIOSH, HHE Report No. 2014-0040-3232: Evolution of Carpal Tunnel Syndrome and Other Musculoskeletal Disorders Among Employees at a Poultry Processing Plant at 13, 17 (2015), <https://www.cdc.gov/niosh/hhe/reports/pdfs/2014-0040-3232.pdf>; Government Accountability Office (GAO), GAO-05-96 Safety and Health of Meat And Poultry Workers 29–30 (2005), <http://www.gao.gov/new.items/d0596.pdf> (describing underreporting of slaughterhouse safety and illness data, citing intimidation and retaliation as reasons why workers don't report injuries); see also Alabama Appleseed and Southern Poverty Law Center (SPLC), *Unsafe at These Speeds* 12–13, 15 (2013), [https://www.splcenter.org/sites/default/files/Unsafe at These Speeds web.pdf](https://www.splcenter.org/sites/default/files/Unsafe%20at%20These%20Speeds%20web.pdf) (describing study that found that between 33% and 69% of all workplace injuries in poultry plants are not counted in OSHA reports; poultry plant employees interviewed stated that they were afraid to report injuries for fear of retaliation).

<sup>58</sup> GAO (2005), *supra* note 57, at 35**Error! Bookmark not defined..**

<sup>59</sup> Human Rights Watch, *Blood, Sweat, and Fear: Workers' Rights in U.S. Poultry Plants* 55 (2005), <https://www.hrw.org/report/2005/01/24/blood-sweat-and-fear/workers-rights-us-meat-and-poultry-plants>.

data collection.”<sup>60</sup> Specifically, the report states that “workers may underreport injuries and illnesses because they fear losing their jobs, and employers may underreport because of concerns about potential costs”<sup>61</sup>—exactly the same issues the GAO reported in 2005.<sup>62</sup>

The chicken industry has also failed to show a commitment to implementing government recommendations to improve worker safety in its plants. As pointed out in our previous comment, when the National Institute for Occupational Safety and Health gave 31 recommendations to reduce the incidence of worker injury and illness in a HIMP slaughterhouse, the slaughterhouse disregarded the bulk of those recommendations.<sup>63</sup> Similarly, NGO reports based on interviews with poultry slaughterhouse workers also detail the companies’ disregard for workers’ safety and even their basic dignity.<sup>64</sup>

FSIS’s regulation setting maximum line speeds<sup>65</sup> specifically requires that slaughterhouses provide safe work and workplaces, “which are free from recognized hazards that are causing or likely to cause death or serious physical harm to ... employees.”<sup>66</sup> Slaughterhouses operating line speeds greater than 140 birds per minute would likely violate this regulation. If FSIS entertains NCC’s petition, it would have to

---

<sup>60</sup> GAO, GAO-16-337 Workplace Safety and Health: Additional Data Needed to Address Continued Hazards in the Meat and Poultry Industry (2016), <http://www.gao.gov/assets/680/676796.pdf>.

<sup>61</sup> *Id.*

<sup>62</sup> GAO (2005), *supra* note 57.

<sup>63</sup> Comment Submitted by MFA, et al., at 7–8.

<sup>64</sup> See Northwest Arkansas Workers’ Justice Center, Wages and Working Conditions in Arkansas Poultry Plants (2016),

[http://www.uusc.org/sites/default/files/wages\\_and\\_working\\_conditions\\_in\\_arkansas\\_poultry\\_plants.pdf](http://www.uusc.org/sites/default/files/wages_and_working_conditions_in_arkansas_poultry_plants.pdf); Oxfam America, No Relief: Denial of Bathroom Breaks in the Poultry Industry

(2016), [https://www.oxfamamerica.org/static/media/files/No\\_Relief\\_Embargo.pdf](https://www.oxfamamerica.org/static/media/files/No_Relief_Embargo.pdf); Oxfam

America, Lives of the Line: The Human Cost of Cheap Chicken (2015),

<https://www.oxfamamerica.org/livesontheline/#>; Alabama Appleseed and Southern Poverty Law Center (SPLC), Unsafe at These Speeds (2013),

[https://www.splcenter.org/sites/default/files/Unsafe\\_at\\_These\\_Speeds\\_web.pdf](https://www.splcenter.org/sites/default/files/Unsafe_at_These_Speeds_web.pdf); Human Rights Watch, Blood, Sweat, and Fear: Workers’ Rights in U.S. Poultry Plants (2005),

<https://www.hrw.org/report/2005/01/24/blood-sweat-and-fear/workers-rights-us-meat-and-poultry-plants>.

<sup>65</sup> 9 C.F.R. § 381.69.

<sup>66</sup> 29 U.S.C. § 654(a).

explain how it would ensure compliance with this requirement in the absence of any line speed limitations whatsoever.

FSIS cannot grant NCC's petition based on NCC's conclusory and self-serving worker injury analysis, which uses unreliable and underreported data, and which is also contradicted by GAO and NGO reports.<sup>67</sup> Because FSIS will likely be unable to rationally explain how granting NCC's petition would not be contrary to its own regulation on worker safety, it must deny this petition.

## **II. If FSIS Does Not Deny NCC's Petition, Then It Must Comply with the National Environmental Policy Act**

Alternatively, if the USDA does not deny NCC's petition outright (as it should), then its consideration of the proposal must comply with the environmental review requirements of the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321, *et eq.*

NEPA requires federal agencies to engage in environmental impact reviews for "major Federal actions significantly affecting the quality of the human environment."<sup>68</sup> The "human environment" is broadly interpreted and includes the natural and physical environment and the relationship of people with that environment.<sup>69</sup> Under Council on Environmental Quality (CEQ) regulations, the adoption of a new federal regulatory scheme<sup>70</sup> that may cause various significant environmental impacts demands a full-fledged Environmental Impact Statement (EIS), rather than the more cursory Environmental Assessment (EA).

NCC's petition seeks to allow poultry slaughterhouses to increase line speeds, an action that would result in significant environmental impacts. In its Proposed Rule for NPIS, FSIS anticipated that 219 slaughterhouses would opt into NPIS, and NCC claims (without support) that setting the maximum line speed at 140 birds per minute is the reason why far fewer slaughterhouses have actually done so.<sup>71</sup> Assuming, for the sake of argument, that NCC is correct, then lifting the line speed limitation as proposed

---

<sup>67</sup> See *Butte County v. Hogen*, 613 F.3d 190, (D.C. Cir. 2010) (explaining that agency action is arbitrary and capricious when the agency ignores evidence contradicting its position).

<sup>68</sup> 42 U.S.C. § 4332(2)(C).

<sup>69</sup> *Id.*

<sup>70</sup> As explained in sections I.A.2 and III, NCC's proposed action is not merely an application of FSIS's existing waiver regulation as claimed but actually is a new regulatory scheme, which effectively repeals the existing maximum line speed regulation.

<sup>71</sup> Petition No. 17-05 at 7.

would mean that many more slaughterhouses would opt into NPIS—potentially even more than the 219 FSIS anticipated—and then begin operating at line speeds higher than 140 birds per minute. Faster line speeds means more birds slaughtered per shift. To supply these slaughterhouses with more birds, contract growers in the surrounding areas would have to expand their operations. Additional barns would likely need to be built to supply chickens to the more than 200 slaughterhouses—if NCC is to be believed—that would operate under NPIS or SIP and the proposed waiver system. More birds would mean more waste, more water use, and more fossil fuels required to transport the animals from the farms to the slaughterhouse.<sup>72</sup> These are all significant environmental impacts, with both individual and cumulative effects at the local, state, and national levels. As explained below, if FSIS considers NCC’s petition, it cannot claim that the categorical exclusion applies, and it must conduct an EIS.

#### **A. If FSIS Considers NCC’s Petition, It Cannot Claim the Categorical Exclusion to NEPA Review Applies**

The USDA’s categorical exclusion for FSIS actions does not apply if “the agency head determines that an action may have a significant environmental effect.”<sup>73</sup> In the Final Rule establishing NPIS, FSIS determined that the categorical exclusion applied and that it did not need to conduct any environmental review because “[t]he maximum line speed for the NPIS *will be no faster* than the maximum line speed permitted under the existing inspection systems. ... Thus, this final rule will not have a significant individual or cumulative effect on the human environment.”<sup>74</sup> In other words, it was only because the final NPIS rule maintained the status quo on maximum line speeds that no assessment of the rule’s environmental impact was needed. FSIS’s explanation makes clear that increased line speeds would have had a significant effect on the environment.

Here, unlike the Final Rule, NCC’s petition would seriously disrupt the status quo. NCC’s petition plainly admits that the entire purpose of its proposal is to increase the number of plants participating in NPIS and to allow each of those plants to slaughter many more chickens.<sup>75</sup> If FSIS grants NCC’s petition, the proposed action cannot be

---

<sup>72</sup> See 40 C.F.R. § 1508.27(b)(2) (intensity of the environmental impact includes “[t]he degree to which the proposed action affects public health or safety”); see also *Tomac v. Norton*, 240 F. Supp. 2d 45, 51 (D.D.C. 2003) (finding EA inadequate because it did not adequately address impact of decision on “air and water” quality in affected area).

<sup>73</sup> 7 C.F.R. § 1b.4.

<sup>74</sup> Final Rule, Modernization of Poultry Inspection, 79 Fed. Reg. 49565, 49610 (Aug. 21, 2014) (codified at 9 C.F.R. pts. 381, 500).

<sup>75</sup> Petition No. 17-05 at 7–8, 11–12.

covered by the categorical exclusion because, as explained below, the proposed action would have a significant environmental effect at the local, state, and national levels.<sup>76</sup>

### **B. Because the Categorical Exclusion Does Not Apply, If FSIS Considers NCC's Petition, It Must Conduct an EIS Pursuant to NEPA**

The CEQ regulations provide that the assessment of whether environmental impacts are “significant” — thus requiring an EIS — “requires considerations of both context and intensity.”<sup>77</sup> “Context” refers to the area affected; the regulations state that “the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region ... and the locality.”<sup>78</sup> “Intensity” refers to “the severity of impact,” and requires consideration of various factors that agencies must address in evaluating whether impacts are sufficiently serious to warrant preparation of an EIS.<sup>79</sup>

Applying the criteria of “context” and “intensity” from the CEQ regulations, NCC’s proposed action would require an EIS. The significance of the proposed action must be analyzed in the contexts of both the local impacts of individual slaughterhouses operating at faster, unlimited slaughter line speeds and the state and national impacts of many slaughterhouses operating at similar speeds.

---

<sup>76</sup> Even if FSIS attempts to claim the categorical exclusion, it would be hard-pressed to explain why NCC’s requested action—lifting limitations on poultry slaughter line speeds, thereby increasing poultry slaughter by untold millions of birds per year at slaughterhouses all over the country—is not an “extraordinary circumstance” triggering an exception to the categorical exclusion. See *Jones v. Gordon*, 792 F.2d 821, 828 (9th Cir. 1986) (claim of categorical exclusion “deficient” when agency “fails to explain why [the agency action] does not fall within an exception to the categorical exclusion[]”); *Riverhawks v. Zepeda*, 228 F. Supp. 2d 1173, 1190 (D. Or. 2002) (agency improperly invoked its categorical exclusion and violated NEPA by failing to “negate the presence of extraordinary circumstances” before proceeding with its proposed action) (emphasis added); *Greenpeace U.S.A. v. Evans*, 688 F. Supp. 579, 585 (W.D. Wash. 1987) (ruling for plaintiff where agency “provided no reasoned explanation—indeed, no explanation at all—of how [mitigating] conditions would prevent application of an exception to the categorical exclusion”); *Alaska State Snowmobile Ass’n, Inc. v. Babbitt*, 79 F. Supp. 2d 1116, 1136-37 (D. Alaska 1999) (agency “abused its discretion” by merely “restat[ing] the categorical exclusion,” and holding that the agency should, “at a minimum, explain its decision that no exceptions applied”), *vacated as moot on other grounds*, 2001 WL 770442, at \*1 (9th Cir. Jan 10, 2001).

<sup>77</sup> 40 C.F.R. § 1508.27.

<sup>78</sup> *Id.* § 1508.27(a).

<sup>79</sup> *Id.* § 1508.27(b).

The factors for assessing intensity laid out in 40 C.F.R. § 1508.27(b) also demonstrate that an EIS is required. First, the proposed action plainly “affects public health or safety” because the increased demand for chickens would also increase demand on water supplies and the danger of spills or other water contamination.<sup>80</sup> Second, the proposed action entails “unique or unknown risks,”<sup>81</sup> because we have no idea, based on NCC’s petition, how fast slaughter line speeds will run, how many lines will be running at these speeds in each slaughterhouse, or how many slaughterhouses will opt into faster line speeds. The goal of NCC’s petition is to allow slaughterhouses to run at speeds faster than 140 or even 175 birds per minute, but (to our knowledge) FSIS has not studied inspection systems in slaughterhouses with line speeds faster than those limits—let alone conducted any analysis of the potential health or other environmental risks. Third, “the effects” of the proposed action “on the quality of the human environment” are certainly “highly controversial.”<sup>82</sup> The proposed action will surely result in expansion of poultry slaughterhouses and of chicken factory farms to supply these slaughterhouses. Similar expansions have recently been the subject of significant opposition.<sup>83</sup>

The proposed action will have to be analyzed according to its cumulative significance to the human environment.<sup>84</sup> Indeed, the very goal of NCC’s proposed action is to increase the number of birds slaughtered and sold by dramatically increasing the number of slaughterhouses running at faster line speeds. There can be no reasonable dispute that the 200-plus poultry slaughter facilities operating at faster line speeds (as is expected by

---

<sup>80</sup> See 40 C.F.R. § 1508.27(b)(2) (intensity of the environmental impact includes “[t]he degree to which the proposed action affects public health or safety”); see also *Tomac v. Norton*, 240 F. Supp. 2d 45, 51 (D.D.C. 2003) (finding EA inadequate because it did not adequately address impact of decision on “air and water” quality in affected area).

<sup>81</sup> 40 C.F.R. § 1508.27(b)(5).

<sup>82</sup> *Id.* § 1508.27(b)(4).

<sup>83</sup> See, e.g., Megan Durisin and Shruti Singh, *How Tyson’s Chicken Plant Became a \$320 Million Turkey*, BLOOMBERG BUSINESSWEEK (Oct. 11, 2017, 2:00 AM), <https://www.bloomberg.com/news/articles/2017-10-11/how-tyson-s-chicken-plant-became-a-320-million-turkey>.

<sup>84</sup> “Cumulative significant includes ‘the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency ... or person undertakes such other actions.’ 40 C.F.R. § 1508.7; see also *Resources Ltd. v. Robertson*, 35 F.3d 1300, 1306 (9th Cir. 1993) (section 1508.7 “specifically requires” consideration of the “cumulative impacts from non-Federal actions,” such as the actions of chicken growers and slaughterhouses).

NCC's petition<sup>85</sup>) would individually and cumulatively have the potential to pollute fresh water.<sup>86</sup> EPA studies have shown that pollutants, including oil and grease, fecal coliforms, ammonia as nitrogen, and total nitrogen, have been "detected in the untreated wastewater" of poultry slaughter facilities "at treatable levels in a significant number of samples, typically five times the baseline value in more than 10 percent of the untreated wastewater samples."<sup>87</sup> Additionally, studies have shown that water coming into contact with chicken excrement can contain bacteria capable of causing serious human illness, including multi-drug-resistant *E. coli*; *Campylobacter*; and the leading cause of food-poisoning-related death, *Salmonella*, which is a growing problem in the United States.<sup>88</sup>

Increasing chicken slaughter could also have a massive impact on water use. The USDA is well aware that poultry slaughter is an immense drain on water supplies. Indeed, the agency itself reports:

It takes an average of [seven] gallons of water to process each bird. The southeastern part of the United States is struggling to meet the water needs of its residents, and water costs are at a premium. In 2005, some poultry processing plants in the South had to cut back on the number of birds they processed because water was not available. The drought has encouraged the privatization of water, with new companies being developed just to sell one of our most precious natural resources.<sup>89</sup>

The EPA has found that chicken slaughterhouses can use more than nine gallons per bird, and they generally create more wastewater per live-weight pound than even cow

---

<sup>85</sup> See *supra* page 16 and note 71.

<sup>86</sup> But even if fewer slaughterhouses opt into unlimited slaughter line speeds than NCC expects, FSIS will still have to analyze the impacts on any given state or local community from any one slaughterhouse that does increase its slaughter line speed.

<sup>87</sup> EPA, Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432), EPA-821-R-04-011, [http://water.epa.gov/scitech/wastetech/guide/mpp/upload/2008\\_07\\_15\\_guide\\_mpp\\_final\\_tdd07.pdf](http://water.epa.gov/scitech/wastetech/guide/mpp/upload/2008_07_15_guide_mpp_final_tdd07.pdf) (last accessed November 27, 2017).

<sup>88</sup> Chai, S. J., et al., *Salmonella enterica Serotype Enteritidis: Increasing Incidence of Domestically Acquired Infections*, 54(S488) CLINICAL INFECTIOUS DISEASES 97 (2012).

<sup>89</sup> Agricultural Marketing Service, *Chillin Chickens Which Method Works Best*, AGRICULTURAL RESEARCH (2008), <http://www.ars.usda.gov/is/ar/archive/apr08/chicken0408.pdf> (last accessed November 28, 2017) (internal quotation marks omitted).

and pig slaughterhouses.<sup>90</sup> Therefore, increasing the number of birds killed increases the demand on dangerously scarce water supplies while increasing the amount of harmful wastewater generated.

The local, regional, and national environmental impacts of NCC's proposed action from water pollution and usage alone are significant. In order to comply with NEPA, FSIS will also have to analyze other impacts to other constituents of the human environment.<sup>91</sup> In summary, if FSIS grants NCC's petition, it could not reasonably invoke the categorical exclusion and will have to conduct an EIS. If it does not, FSIS would surely be inviting litigation challenging its compliance with NEPA.

### **III. If FSIS Decides to Grant NCC's Petition, Then It Must Comply with Rulemaking Procedures Pursuant to the Administrative Procedure Act**

Alternatively, even if the USDA does not deny NCC's petition outright (as it should), then it must follow proper procedures and initiate notice-and-comment rulemaking pursuant to the Administrative Procedure Act (APA), 5 U.S.C. § 553.<sup>92</sup> If it does not, such agency action would be not only unlawful and arbitrary and capricious in substance, as demonstrated above, but procedurally invalid.

As explained above, contrary to NCC's false portrayal of its requested action as a "waiver," the proposal in no way complies with the requirements of the regulations under 9 C.F.R. 381.3(b). Rather, the requested action is a significant change to, and practically speaking, a repeal of, an existing regulation—the line speed maximum for NPIS contained in 9 C.F.R. § 381.69(a)—which was properly promulgated pursuant to

---

<sup>90</sup> EPA, EPA-821-R-04-011, Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432) 6–7, 6–8, [http://water.epa.gov/scitech/wastetech/guide/mpp/upload/2008\\_07\\_15\\_guide\\_mpp\\_fin al\\_tdd06.pdf](http://water.epa.gov/scitech/wastetech/guide/mpp/upload/2008_07_15_guide_mpp_final_tdd06.pdf) (last accessed November 27, 2017). In the same document, EPA also points out that poultry slaughter wastewater may contain "[ ] pathogens of enteric origin, such as *Salmonella sp.* and *Campylobacter jejuni*, gastrointestinal parasites, and pathogenic enteric viruses).

<sup>91</sup> E.g., impacts to public health and safety, 40 C.F.R. § 1508.27, and impacts to air, aquatic, and terrestrial environments, *Metro. Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 772–773 (1983) (quoting Sen. Jackson discussing "air, land, and water" and Rep. Dingell discussing "air, aquatic and terrestrial environments").

<sup>92</sup> This issue is also raised by the comments submitted by Food and Water Watch and Southern Poverty Law Center. MFA and HSUS also join Food and Water Watch's request that FSIS provide a public hearing on the proposed rule pursuant to 21 U.S.C. § 463(c).

the APA. Therefore, NCC's requested action must be treated as a new rule or an amendment to an existing regulation.

A "rule" is "an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy describing the organization, procedure, or practice requirements of an agency."<sup>93</sup> There are two types of agency rules: legislative and interpretive. Legislative rules "grant rights, impose obligations, or produce other significant effects on private interests, or which ... change ... existing law or policy."<sup>94</sup> "Interpretive rules, by contrast, ... merely clarify or explain existing law or regulations."<sup>95</sup>

There are different procedural requirements when agencies issue legislative versus interpretive rules. Legislative rules have "the force and effect of law" and must be issued through "notice-and-comment" rulemaking.<sup>96</sup> In contrast, interpretative rules are exempt from the notice-and-comment process.<sup>97</sup>

NCC's proposed action does much more than implement, interpret, or explain existing law or regulations. Rather, the requested action "adopts a new position inconsistent with existing regulations, [and] otherwise effects a substantive change in existing law or policy,"<sup>98</sup> because it creates a broad exception<sup>99</sup> to the line speed limitation regulation, and it "grants rights"<sup>100</sup> to poultry slaughterhouses to run a line in excess of line speed limits. Therefore, even if FSIS grants NCC's petition, it can only promulgate the proposed action through notice-and-comment rulemaking.<sup>101</sup> Moreover, Congress

---

<sup>93</sup> 5 U.S.C. § 551(4).

<sup>94</sup> *Am. Hosp. Ass'n v. Bowen*, 834 F.2d 1037, 1045 (D.C. Cir. 1987).

<sup>95</sup> *Id.*

<sup>96</sup> *Perez v. Mortgage Bankers Ass'n*, 135 S. Ct. 1199, 1203 (2015) (quoting *Chrysler Corp. v. Brown*, 441 U.S. 281, 302–303 (1979)).

<sup>97</sup> 5 U.S.C. § 553(b); *Perez*, 135 S. Ct. at 1204.

<sup>98</sup> *Mendoza v. Perez*, 754 F.3d 1002, 1021 (D.C. Cir. 2014).

<sup>99</sup> Yet another reason the requested action is unlawful is because the PPIA authorizes only the Secretary to grant exemptions from provisions of the PPIA in a specific set of circumstances, none of which apply to NCC's petition. 21 U.S.C. § 464. Further, these exemptions can only be granted "by regulation." *Id.*

<sup>100</sup> *Bowen*, 834 F.2d at 1045.

<sup>101</sup> Notice-and-comment rulemaking requires: (1) adequate advance notice and publication of a proposed rule in the Federal Register; (2) an opportunity for interested persons to comment; (3) consideration by FSIS of the comments submitted by interested persons; (4) publication of the final rule with a statement of basis and purpose not less than 30 days before its effective date;

clearly signaled that FSIS must comply with the procedural requirements of the APA when creating rules and regulations under the PPIA.<sup>102</sup>

Because NCC's requested action is a legislative rule requiring notice-and-comment rulemaking, if FSIS grants NCC's petition, it must also provide an explanation of its reasons for reversing course from the Final NPIS rule and lifting poultry slaughter line speed limits.<sup>103</sup> As the Supreme Court has made clear, "[o]ne of the basic procedural requirements of administrative rulemaking is that an agency must give adequate reasons for its decisions [by] examin[ing] the relevant data and articulat[ing] a satisfactory explanation for its action including a rational connection between the facts found and the choice made."<sup>104</sup> Further, "[a]gencies are free to change their existing policies as long as they provide a reasoned explanation for the change."<sup>105</sup>

So far, FSIS has not initiated notice-and-comment rulemaking because it has not published anything regarding NCC's petition in the Federal Register. FSIS's Constituent Update<sup>106</sup> announcing the opening of this public comment period gave no further details of how FSIS plans to interpret NCC's request or implement the proposed action, if granted. The public currently has no content or details of the so-called waiver system. All we know is that participating slaughterhouses will enroll in NPIS or SIP and that they must "maintain process control."<sup>107</sup> This is completely vague. This lack of

---

and (5) the right of petition for the issuance, modification, or repeal of the rule by interested persons. 5 U.S.C. § 553; *Cove Assocs. Joint Venture v. Sebelius*, 848 F.Supp. 2d 13, 26 (D.D.C. 2012).

<sup>102</sup> See 21 U.S.C. § 463 (specifically citing 5 U.S.C. § 553).

<sup>103</sup> *Perez*, 135 S. Ct. at 1203.

<sup>104</sup> *Encino Motorcars v. Navarro*, 136 S.Ct. 2117, 2125 (2016) (quoting *Motor Vehicle Mfrs. Assn. of United States v. State Farm Mut. Automobile Ins. Co.*, 463 U.S. 29, 43 (1983)).

<sup>105</sup> *Id.*; see also *id.* at 2126–2127 (vacating agency's change of policy because agency failed to follow proper procedures by not providing any explanation for its change in position).

<sup>106</sup> FSIS, *Comment Submission on National Chicken Council Petition for Line Speed Waivers*, CONSTITUENT UPDATE, Vol. 21, No. 2 (Oct. 13, 2017), [https://www.fsis.usda.gov/wps/wcm/connect/a54d5331-372e-4df3-ac4d-8c2953969039/ConstiUpdate101317.pdf?MOD=AJPERES&CONVERT\\_TO=url&CACHEID=a54d5331-372e-4df3-ac4d-8c2953969039](https://www.fsis.usda.gov/wps/wcm/connect/a54d5331-372e-4df3-ac4d-8c2953969039/ConstiUpdate101317.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=a54d5331-372e-4df3-ac4d-8c2953969039).

<sup>107</sup> Petition No 17-05. This is hardly a requirement at all, since all poultry slaughterhouses are already required to have "a process for monitoring and ensuring it is maintaining process control." 9 C.F.R. § 381.65(g).

information has already hindered the opportunity for thorough public review and comment on the proposed action.<sup>108</sup>

Indeed, it appears that FSIS's handling of NCC's petition thus far (accepting it as a "petition for policy change" rather than a "petition for rulemaking" and taking public comment without publication in the Federal Register) is akin to a practice of federal agencies recently decried by Attorney General Sessions: "evading required rulemaking processes by using [interpretive rules, contained in documents such as guidance memos] to create de facto regulations."<sup>109</sup>

It is not surprising that NCC is attempting to circumvent the proper process for rulemaking by disingenuously characterizing its request as a "waiver." Regardless of NCC's egregious mischaracterization, however, FSIS is statutorily obligated to follow proper administrative rulemaking procedures.

#### **IV. Alternatively, If FSIS Decides to Grant NCC's Petition, Then It Should Require Multi-Stage Controlled-Atmosphere Killing as a Condition of Increasing Line Speeds Above Established Limits**

Alternatively, if the USDA grants NCC's petition, then it should require that, as a condition of participation, a poultry slaughterhouse process chickens in a manner that avoids pre-stun handling and instead utilizes a multi-step controlled-atmosphere processing system that induces an irreversible stun ("multi-stage Controlled Atmosphere Killing" or "multi-stage CAK"). This condition is absolutely necessary to mitigate against the increased worker safety and animal welfare concerns.

NCC's petition seeks free rein for poultry slaughterhouses to operate at whichever line speeds they choose, tempered only by a vague (not to mention already existing) requirement that those slaughterhouses maintain process control. As discussed above and in our previously submitted comment, faster slaughter line speeds will undoubtedly result in more frequent loss of process control, and FSIS is unlikely to be

---

<sup>108</sup> The APA requirements are designed to "ensure fairness to affected parties" and "provide[] a well-developed record that enhances the quality of judicial review. *Sprint Corp. v. F.C.C.*, 315 F.3d 369, 373 (D.C. Cir. 2003).

<sup>109</sup> Press Release, Dep't of Justice, Attorney General Jeff Sessions Ends the Department's Practice of Regulation by Guidance (Nov. 17, 2017), <https://www.justice.gov/opa/pr/attorney-general-jeff-sessions-ends-department-s-practice-regulation-guidance>; see also Memorandum from the Att'y Gen., Prohibition on Improper Guidance Documents (Nov. 16, 2017), <https://www.justice.gov/opa/press-release/file/1012271/download>.

able to rationally explain how removing line speed limits will result in similar or better process control than is currently achieved with the line speed limit for NPIS. Therefore, even if FSIS decides to grant NCC's petition, it should require meaningful mitigating conditions of slaughterhouse participation. One such mitigating condition should be that the slaughterhouse implements multi-stage CAK.

Multi-stage CAK systems would help maintain process control.<sup>110</sup> In such systems, the birds are stunned or killed while in their transport cages and so do not need to be removed from their cages, dumped onto conveyor belts, and violently shackled upside down while still conscious. This would facilitate proper hanging of the chickens, which in turn would decrease the likelihood that birds suffer bruising or broken bones or that they miss the killing blade and are scalded alive.<sup>111</sup> Multi-stage CAK improves worker safety as well, since hanging unconscious or dead birds means that the birds are not pecking, scratching, and defecating on the workers.

As a practical matter, 72 companies, comprising over 150 brands,<sup>112</sup> have committed to switching some of their plants to less cruel slaughter systems or to sourcing from plants that have switched. The industry, driven by consumer demand, is shifting; soon companies that slaughter poultry will need to supply chickens who are killed by methods other than live hang and electric water-bath stunning to meet consumer demand. Indeed, major suppliers, such as Perdue, have already committed to supplying chickens killed by less cruel slaughter systems.<sup>113</sup> Therefore, any argument that creating this condition for eliminating regulatory caps on line speeds would be too burdensome or costly to producers would be disingenuous.

To be clear, FSIS should deny NCC's dangerous petition outright because the proposed waiver system is unlawful and arbitrary and capricious. We only propose that if FSIS nevertheless decides to grant the petition, then it should require that slaughterhouses implement multi-stage CAK as a precondition to participating in the waiver system.

---

<sup>110</sup> See generally Sara Shields and Mohan Raj, *A Critical Review of Electrical Water-Bath Stunning Systems for Poultry Slaughter and Recent Developments in Alternative Technologies*, 13(4) J. APPLIED ANIMAL WELFARE SCI. 281 (2010).

<sup>111</sup> See generally Theo Hoen and Jeannette Lankhaar, *Controlled Atmosphere Stunning of Poultry*, 78 POULTRY SCI. 287 (1999).

<sup>112</sup> See, e.g., Kate Vitasek, *McDonald's Secret Sauce For Improving Animal Welfare*, Forbes (Nov. 26, 2017, 4:00 PM), <https://www.forbes.com/sites/katevitasek/2017/11/26/mcdonalds-secret-sauce-for-improving-animal-welfare/#78ed7f297d05>.

<sup>113</sup> Perdue Foods, Press Release, *Perdue Farms Announces Animal Care Improvements and Commits to Future Advancements* (July 17, 2017), <https://www.perdufarm.com/news/press-releases/commitments-to-animal-care-2017-announcem>.

This is necessary to ensure that slaughterhouses actually maintain process control, to reduce the likelihood of egregious animal cruelty, and to maintain safe working conditions while slaughterhouses operate at high line speeds.

## **V. Conclusion**

Even just a few weeks into the public comment period, it is already abundantly clear that there is widespread public opposition to the proposed action. As of December 4, 2017, over 17,500 comments have already been submitted, essentially all of them staunchly opposed to NCC's petition. Ignoring this public outcry and granting NCC's petition would be a slap in the face to the public and would destroy trust in our food system and in FSIS's commitment to oversight of the entities it is charged with regulating.

For all the reasons stated above we strongly urge FSIS to deny NCC's dangerous petition.

Respectfully submitted,

Vandhana Bala  
VandhanaB@MercyForAnimals.org  
General Counsel  
Mercy For Animals

Amanda Hungerford  
AHungerford@humanesociety.org  
Staff Attorney  
Humane Society of the United States

## ATTACHMENTS

1. Comment submitted by Mercy For Animals, Animal Welfare Institute, the American Society for the Prevention of Cruelty to Animals, Farm Forward, Animal Legal Defense Fund, Compassion Over Killing, and The Humane Society of the United States (Sept. 20, 2017).
2. Comment submitted by The Humane Society of the United States re. Docket ID No. FSIS-2011-0012, Modernization of Poultry Slaughter Inspection Rule (May 29, 2012).

**Before the Food Safety and Inspection Service,  
U.S. Department of Agriculture**

**Comment Regarding Petition No. 17-05**

**Submitted by:**



**September 20th, 2017**

September 20, 2017

**TO:**

Ms. Carmen Rottenberg  
Acting Deputy Under Secretary for Food Safety  
Food Safety and Inspection Service  
U.S. Department of Agriculture  
331-E Jamie L. Whitten Federal Bldg.  
1400 Independence Ave. SW  
Washington, DC 20250-3700

**CC:**

Ms. Roberta Wagner  
Assistant Administrator, Office of Policy and Program Development  
Ms. Rachel Edelstein  
Director, Policy Issuances Division  
Food Safety and Inspection Service  
U.S. Department of Agriculture  
350-E Jamie L. Whitten Federal Bldg.  
1400 Independence Ave. SW  
Washington, DC 20250-3700

**RE: Comments in Opposition to Petition No. 17-05 Submitted by National Chicken Council**

Dear Acting Deputy Under Secretary Rottenberg:

We, the undersigned, on behalf of our combined tens of millions of supporters, submit the following comments<sup>1</sup> in response to the petition submitted by National Chicken Council (NCC) requesting implementation of a waiver system under New Poultry Inspection System (NPIS) and *Salmonella* Initiative Program (SIP) to permit establishments to run at any line speed they wish. For the reasons discussed below, we urge you to deny the petition.

---

<sup>1</sup> Pursuant to 9 C.F.R. § 392.7.

Authorizing line speeds in excess of 140 or 175 birds per minute, as already authorized at certain plants, presents unacceptable risks to animal welfare and worker safety<sup>2</sup> without meaningful gains in food safety or any of the other considerations and obligations of FSIS. In fact, the proposed action runs counter to FSIS's goals, responsibilities, and duties under Poultry Products Inspection Act (PPIA).<sup>3</sup>

FSIS should deny NCC's ill-conceived policy proposal for the following reasons:

1. The requested action would probably result in losses of process control due to fast line speeds.
2. The requested action would increase the likelihood of inhumane handling, which in turn would increase the risk that birds would "be bruised or die other than by slaughter" and result in adulterated product.
3. The requested action would risk worker safety and welfare by increasing the likelihood of injuries for establishment workers and inspection personnel at establishments operating under unregulated line speeds. High worker turnover, or workers on the job while injured or sick, can in turn cause loss of process control.

## **I. NCC's Requested Action Is Guaranteed to Result in Losses of Process Control**

As explained in greater detail below, there is a clear correlation between high line speeds and loss of process control. The NCC petition argues that the industry should not be restricted in terms of line speed because it is capable of maintaining control over the slaughtering and processing of chickens, even at recklessly high speeds. There are limits to the speed at which humans and equipment can function, however. The higher the line speed, the greater the risk of loss of process control. Thousands of USDA records (memorandums of interview and noncompliance records) document loss of

---

<sup>2</sup> Many of the reasons were already presented to FSIS in response to this aspect of the 2012 proposed rule on the implementation of NPIS.

<sup>3</sup> 21 U.S.C. § 451, et seq. The petition's weak proposal to have establishments "develop a process" for maintaining process control fails to address this risk. Moreover, the petition fails to acknowledge the obvious regulatory burdens this would place on the agency; FSIS would probably have to review, verify, monitor, and enforce each establishment's individual process for maintaining process control under whichever line speed(s) the plant may attempt to operate to ensure that the plan is sufficient to maintain process control.

process control incidents related to inhumane handling at major U.S. chicken plants.<sup>4</sup> These situations jeopardize animal welfare, worker health and safety, and food safety. Moreover, in many of these incidents, it is the government inspector—not plant personnel—who note the loss of control. Unfortunately, under New Poultry Inspection System fewer government inspectors will be available at chicken slaughtering establishments to monitor for loss of process control and to order corrective action to regain control if it is lost.

NCC's petition exaggerates the regulatory burdens of the maximum authorized line speed under NPIS. As FSIS stated in the final rule, NPIS already gives establishments "greater control over their lines and greater flexibility over their production process."<sup>5</sup> The main reason for NCC's requested action is to increase production. However, as FSIS has already pointed out, line speed is just one of several factors affecting production levels and establishments can increase production by operating more inspection lines.<sup>6</sup> In sum, the risk to maintaining process control outweighs any asserted gain to the U.S. poultry industry, especially when there are viable solutions that would enable a plant to increase production without further compromising process control, animal welfare, and worker safety.

## **II. NCC's Requested Action Would Increase Risk of Inhumane Handling and Adulteration of Poultry Products**

Though the issue of live handling and animal welfare in high-speed poultry slaughter establishments is glaringly absent from NCC's petition, the requested action would have a serious impact on the billions of chickens and hundreds of millions of turkeys who would be slaughtered at speeds higher than the current maximum authorized speed.

For over 12 years, FSIS has recognized that "poultry products are more likely to be adulterated [under the Poultry Products Inspection Act (PPIA)] if, among other circumstances, they are produced from birds who have not been treated humanely, because such birds are more likely to be bruised or to die other than by slaughter."<sup>7</sup> In

---

<sup>4</sup> Copies of some of these records are attached hereto.

<sup>5</sup> 79 Fed. Reg. 49590.

<sup>6</sup> 79 Fed. Reg. 49590.

<sup>7</sup> FSIS, Final Rule, Modernization of Poultry Slaughter Inspection, 79 FED. REG. 49565, 49609 (Aug. 21, 2014) (quoting FSIS, Treatment of Live Poultry Before Slaughter, 70 FED. REG. 56624 [Sept. 28, 2005]).

addition to the problem of adulteration, in reviewing the petition, FSIS must consider the link between animal handling and meat quality. Dozens of research articles document the link between inhumane handling and damaged and poor-quality product.<sup>8</sup> The poultry industry also acknowledges this fact.<sup>9</sup> Thus, the proposed action also bears risks of increasing costs to the industry and ultimately consumers from poor meat quality.

As stated, inhumane handling can violate PPIA because it causes birds to bruise or to die other than by slaughter. Specifically, increased line speeds pose a risk of inhumane handling in the following ways:

- Workers stressed by the demands of increased speed may act out their frustrations by physically abusing live birds, resulting in injuries to birds, such as bruises and fractures.<sup>10</sup>
- Faster shackling of live birds may lead to less care in handling and increased incidence of bruising or broken and dislocated bones.<sup>11</sup>

---

<sup>8</sup> S. Barbut, *Pale, Soft and Exudative Poultry Meat—Reviewing Ways to Manage at the Processing Plant*, 88 POULTRY SCI. 1506 (2009) (stress from handling before slaughter and during stunning recommended as ways to reduce incidence of poor quality, pale, soft, and exudative meat); C.M. Owens, *Research Developments in Pale, Soft, and Exudative Turkey Meat in North America*, 88 POULTRY SCI. 1513 (2009) (birds killed in an excited state has profound implications for the quality of their meat); M. Debut, et al., *Variation of Chicken Technological Meat Quality in Relation to Genotype and Pre-Slaughter Stress Conditions*, 82 POULTRY SCI. 1829 (2003) (high-stress environments leading to more wing flapping on the shackle could be detrimental to quality of breast meat); R.L. Woelfel, et al., *The Characterization and Incidence of Pale, Soft and Exudative Broiler Meat in a Commercial Processing Plant*, 81 POULTRY SCI. 579 (2002) (stressors including pre-slaughter handling practices and stunning methods can result in pale, soft and exudative meat).

<sup>9</sup> W. Schilling, *How Animal Care Affects Meat Quality*, MEATINGPLACE (Apr. 21, 2014) (“Optimizing welfare conditions during catching, transport, holding, unloading, stunning and slaughter is crucial to the poultry industry for the good of the bird and because stress between loading on the farm and slaughter contributes to decreased meat quality.”).

<sup>10</sup> Animal Welfare Institute, *The Welfare of Birds at Slaughter in the United States* 12 (2016), <https://awionline.org/sites/default/files/products/FA-Poultry-Slaughter-Report-2016.pdf>.

<sup>11</sup> U.K. Department for Environment, Food and Rural Affairs (DEFRA), *The Welfare of Poultry at Slaughter or Killing* 30 (Dec. 2007); see also Temple Grandin, *Welfare During Transport of Livestock and Poultry*, in Temple Grandin, ed., *IMPROVING ANIMAL WELFARE: A PRACTICAL APPROACH* 115-38 (2010) (“The author has observed that rough shackling is a major cause of bruised drumsticks. The people doing the shackling squeeze the legs too hard when they put the birds on the shackles. An understaffed shackle line where people have to hurry is one cause of bruised legs.”).

- Less time for birds to settle after being shackled may result in increased flapping at the entrance to the water-bath stunner, which may lead to pre-stun shocks, delayed or interrupted stunning, and birds missing the stunner altogether.<sup>12</sup>
- Faster line speeds will lessen the time available to administer a back-up stun if needed. This may lead more birds to miss the throat-cutting machine (and the back-up throat cutter) and enter the scalding tank while still alive—and thereby die other than by slaughter.<sup>13</sup>
- Faster shackling of live birds may increase the incidence of improper shackling, such as shackling by one leg, a wing, or the head. Improper shackling may result in improperly stunned birds, which leads more birds to miss the cutter and enter the scalding tank alive.<sup>14</sup>

FSIS's own Poultry Good Commercial Practices (GCP) non-compliance records concerning inhumane handling of birds from high line speeds at chicken slaughter establishments demonstrate these risks. Each of the incidents documented in non-compliance records represents a loss of process control, and thus does not capture the full picture of animal mistreatment occurring in poultry slaughter establishments. The following are just a few examples of these records:

- At Tyson Foods Inc. (P325) on two occasions in August and September 2016, the inspector found numerous red cadavers, and the inspector determined that the birds were alive when they entered the scalding tank. During the September incident, the back-up killer failed to stop the line for live birds as should occur under the plant's process control plan. On each occasion, the line was operating at a reduced speed to comply with a corrective action. The inspector noted this was a repeat issue. (MOIs # YDM3010081602N and YDM2821093919N).
- At Gold'n Plump Poultry (M322A) on February 14, 2016, the inspector found a total of 79 cadavers, each bright red, indicating the birds had entered the scalding tank alive or not fully bled out. The inspector directly observed three live birds on the line enter the scalding tank, two flapping their wings and one also vocalizing. Regulatory control action stopped the line. (MOI # CNC 0022023415N-1).

---

<sup>12</sup> DEFRA, *supra* note 11; see also Sarah Shields and Mohan Raj, *A Critical Review of Electrical Water-Bath Stun Systems for Poultry Slaughter and Recent Developments in Alternative Technologies*, 13:4 J. APP. ANIMAL WELFARE SCI. 281, 284 (2010) (citing literature that wing flapping at the entrance to the stunner can lead to painful pre-stun shocks); J. Gatcliffe, *Electrical Waterbath Stunning of Turkeys* (technical article), Aviagen Turkeys Ltd., (no date).

<sup>13</sup> Federation of Veterinarians of Europe, *Welfare of Animals at Slaughter and Killing* at 7–8, FVE/06/033 (Oct. 2007).

<sup>14</sup> Animal Welfare Institute, *The Welfare of Birds at Slaughter in the United States* 9 (2016), <https://awionline.org/sites/default/files/products/FA-Poultry-Slaughter-Report-2016.pdf>.

- At Simmons Prepared Foods Inc. (P550) on August 16, 2016, the inspector found severe bruising and pooled blood on 32 carcasses, most with bruising on over half the body. Dislocated legs and broken wings were the most prevalent causes of bruising. Regulatory control action stopped the line three separate times during the shift. (MOI # XWN1520083016G).
- At OK Foods Inc. (P165S) on January 6, 2016, the inspector found 10 birds hung on the shackles, each by one leg. Some of these birds were “not rendered insensible and had the dangling leg dismembered by the head removal saw” while alive and conscious. Minutes later, another 10 birds were observed, each hung by one leg. Regulatory control action reduced line speed, but 20 minutes later four more birds were observed hanging, each by just one leg. A similar incident had occurred three weeks prior. The plant was written up again on January 25 for the same issue; the inspector saw four birds, each hung by only one leg, miss the electric stunner and have the dangling leg cut off by the head removal saw while the birds were alive and conscious. (no MOI number).

Whistleblower accounts have also repeatedly documented similar incidents, as well as workers egregiously abusing live birds in high-speed poultry slaughter establishments.<sup>15</sup> The following are just a few examples:

- A 2015 investigation at Butterfield Foods (P215) documented 45 live birds entering the scalding tank in less than 30 minutes.<sup>16</sup>
- A 2015 investigation at Mountaire Farms Chicken (P7470) recorded workers violently throwing birds, punching hanging birds, slamming birds into leg shackles, and throwing live birds into piles with dead birds.<sup>17</sup>
- A 2015 investigation at Tyson Foods (P758) recorded workers punching live, hanging birds; ripping the heads off live birds; and violently slamming birds into shackles.<sup>18</sup>
- A 2015 investigation at Foster Farms (P5137A) recorded workers violently slamming live birds into shackles; workers punching and beating live, hanging

---

<sup>15</sup> These incidents occur in the first processing segment of the processing plant, precisely the aspect of poultry slaughter that the NCC petition acknowledges would be most impacted by increases in line speeds. NCC Petition (No. 17-05), at 10.

<sup>16</sup> Humane Society of the United States, Spent Hen Slaughter Exposé: Birds Abused and Scalded Alive (2015), [https://www.youtube.com/watch?v=eM-JsyyfSmE&has\\_verified=1](https://www.youtube.com/watch?v=eM-JsyyfSmE&has_verified=1) (last visited Sept. 13, 2017).

<sup>17</sup> Compassion Over Killing Uncovers Abuse to Birds at Mountaire Farms Chicken Slaughterhouse, <http://cok.net/inv/mountaire/> (last visited Sept 13, 2017).

<sup>18</sup> Mercy For Animals, Tyson Caught on Hidden Camera Ripping Heads Off Live Animals, [https://www.youtube.com/watch?v=0L2mGC4zezM&has\\_verified=1](https://www.youtube.com/watch?v=0L2mGC4zezM&has_verified=1) (last visited Sept. 13, 2017).

chickens; and improperly shackled birds missing the electric stun bath and being scalded alive.<sup>19</sup>

- A 2015 investigation at Tyson Foods (P7044) recorded workers violently slamming live birds into shackles; workers hanging dead birds for slaughter and processing; and recurring equipment malfunctions that resulted in mass deaths of hundreds of chickens.<sup>20</sup>

As the GCP records and these investigations illustrate, line speed can contribute not only to process control failure but also to the establishment's failure to take immediate corrective action (e.g., stopping the line before live chickens enter the scalders).

### III. NCC's Requested Action Would Increase Risk of Worker Injury

Granting NCC's requested action would greatly increase risk to worker health and safety in the establishments operating under line speed waivers and would expose workers to hazards that have not even been studied.

According to the National Institute for Occupational Safety and Health (NIOSH), line speed is a key factor in musculoskeletal disorders.<sup>21</sup> In a study of a HIMP poultry establishment, NIOSH investigators "found an alarming 42% prevalence of carpal tunnel syndrome in exposed workers."<sup>22</sup> According to OSHA statistics, poultry processing, even at current speeds, is a seriously dangerous industry for workers. The poultry industry's Days Away, Restrictions, and Transfers rates are almost double the rate in private industry, the incidence of occupational illness is more than six times the average rate in private industry, and the incidence of carpal tunnel syndrome is more than seven times the national average.<sup>23</sup>

The poultry industry's commitment to worker safety is dubious. In NIOSH's study of a poultry plant operating under HIMP, NIOSH made 31 health and safety

---

<sup>19</sup> Mercy For Animals, Shocking Animal Abuse Exposed at "American Humane Certified" Foster Farms Slaughterhouse (2015), [https://www.youtube.com/watch?v=0L2mGC4zezM&has\\_verified=1](https://www.youtube.com/watch?v=0L2mGC4zezM&has_verified=1) (last visited Sept. 13, 2017).

<sup>20</sup> Animal Legal Defense Fund, ALDF Investigation Exposes Tyson Cruelty, [https://www.youtube.com/watch?time\\_continue=1&v=d8PO3MQaDts](https://www.youtube.com/watch?time_continue=1&v=d8PO3MQaDts) (last visited Sept. 13, 2017).

<sup>21</sup> Letter from NIOSH to FSIS (April 7, 2014), <https://www.cdc.gov/niosh/topics/poultry/letterapril72014.html>.

<sup>22</sup> Letter from NIOSH, *supra* note 21.

<sup>23</sup> OSHA, Inspection Guidance for Poultry Slaughtering (Oct. 28, 2015), [https://www.osha.gov/dep/enforcement/poultry\\_processing\\_10282015.html](https://www.osha.gov/dep/enforcement/poultry_processing_10282015.html).

recommendations to help prevent worker injuries. Ten months later, most of those 31 recommendations had not been implemented by the plant.<sup>24</sup> A NIOSH study of a different HIMP poultry establishment found that, although 64 workers had carpal tunnel syndrome, only four cases were reported on the plant's OSHA 300 log.<sup>25</sup> Additionally, 20 out of 30 employees (66%) reported at least one work-related injury or illness that met OSHA reporting criteria, but only one was reported on the OSHA 300 log.<sup>26</sup> Many of the injured workers interviewed had reported their injury or illness to a supervisor, manager, the plant nurse, or other company employee.<sup>27</sup> NIOSH's findings of underreporting are consistent with the findings of NGO reports based on in-depth interviews with poultry slaughterhouse workers.<sup>28</sup>

To arrive at the maximum authorized line speed for NPIS, FSIS reviewed the NIOSH studies and consulted with OSHA to address worker safety issues.<sup>29</sup> NCC's petition seeks to sidestep all that consultation.<sup>30</sup>

#### IV. Conclusion

In conclusion, NCC's requested action, if granted, would create unacceptably high risks of (1) loss of process control from recklessly high line speeds; (2) inhumane handling of birds, leading to a correlated risk of adulterated poultry products entering the food supply; and (3) injuries to poultry slaughter workers. NCC's petition, on behalf of a 90

---

<sup>24</sup> Letter from NIOSH, *supra* note 21.

<sup>25</sup> Jessica G. Ramsey, et al., NIOSH, HHE Report No. 2014-0040-3232: Evaluation of Carpal Tunnel Syndrome and Other Musculoskeletal Disorders Among Employees at a Poultry Processing Plant 10, 13 (2015), <https://www.cdc.gov/niosh/hhe/reports/pdfs/2014-0040-3232.pdf>.

<sup>26</sup> Ramsey, et al., *supra* note 25 at 13.

<sup>27</sup> Ramsey, et al., *supra* note 25 at 17.

<sup>28</sup> See, e.g., Human Rights Watch, Blood Sweat and Fear 52–54, 61–66 (2005), <https://www.hrw.org/report/2005/01/24/blood-sweat-and-fear/workers-rights-us-meat-and-poultry-plants>; Alabama Appleseed and Southern Poverty Law Center, Unsafe at These Speeds 12–13, 15 (2013), [https://www.splcenter.org/sites/default/files/Unsafe at These Speeds web.pdf](https://www.splcenter.org/sites/default/files/Unsafe%20at%20These%20Speeds%20web.pdf).

<sup>29</sup> 79 Fed. Reg. 49596–49597.

<sup>30</sup> We are also greatly concerned that FSIS would consider NCC's proposed action as a policy change rather than a rulemaking. We strongly urge FSIS, if it does not deny NCC's petition, to provide the opportunity for notice and public comment on the proposed action. FSIS is aware that this issue is of great public concern since "the vast majority of comments that the Agency received in response to the proposed [NPIS] rule were on [the effects of increased line speeds on worker safety]." 79 Fed. Reg. 49598.

billion dollar<sup>31</sup> industry, seeks to increase profits at the expense of important policy considerations. For these reasons, we ask that you deny NCC's petition for policy change. If you have any questions, please contact Stefanie Wilson, staff attorney for Mercy For Animals, at [StefanieW@MercyForAnimals.org](mailto:StefanieW@MercyForAnimals.org) or 510-926-2813.

Signed,

Stefanie Wilson  
[StefanieW@mercyforanimals.org](mailto:StefanieW@mercyforanimals.org)  
Staff Attorney  
Mercy For Animals



Dena Jones  
[Dena@awionline.org](mailto:Dena@awionline.org)  
Director, Farm Animal Program  
Animal Welfare Institute



Deborah Dubow Press  
[Deborah.Press@aspca.org](mailto:Deborah.Press@aspca.org)  
Director of Regulatory Affairs  
The American Society for the Prevention of Cruelty to Animals



*(cont'd)*

---

<sup>31</sup> NCC, Broiler Chicken Industry Key Facts 2016, <http://www.nationalchickencouncil.org/about-the-industry/statistics/broiler-chicken-industry-key-facts/> (last visited Sept. 15, 2017).

Andrew deCoriolis  
AndrewD@farmforward.com  
Policy Director  
Farm Forward



Lindsay Larris  
LLarris@aldf.org  
Acting Director, Legislative Affairs Program  
Animal Legal Defense Fund



Erica Meier  
EMeier@cok.net  
Executive Director  
Compassion Over Killing



Amanda Hungerford  
AHungerford@humanesociety.org  
Staff Attorney  
Humane Society of the United States





**THE HUMANE SOCIETY  
OF THE UNITED STATES**

May 29, 2012

**OFFICERS**

Anita W. Coupe, Esq.  
*Chair of the Board*  
Jennifer Leaning, M.D., S.M.H.  
*Vice Chair of the Board*  
Walter J. Stewart, Esq.  
*Board Treasurer*  
Wayne Pacelle  
*President & CEO*  
G. Thomas Waite III  
*Treasurer & CFO*  
Roger A. Kindler, Esq.  
*General Counsel & CLO*  
Janet D. Frake  
*Secretary*  
Andrew N. Rowan, Ph.D.  
*Executive Vice President  
Operations*  
Michael Markarian  
*Executive Vice President  
External Affairs*

**STAFF VICE PRESIDENTS**

John Balzar  
*Senior Vice President  
Communications*  
Patricia A. Forkan  
*Senior Vice President  
International*  
John W. Grandy, Ph.D.  
*Senior Vice President  
Wildlife & Habitat Protection*  
Constance Harriman-Whitfield  
*Senior Vice President  
Philanthropy*  
Holly Hazard  
*Chief Innovations Officer*  
Heidi Prescott  
*Senior Vice President  
Campaigns*  
Geoffrey L. Handy  
*Media and Online  
Communications*  
Katherine B. Liscomb  
*Administration &  
Animal Care Centers*  
Jonathan R. Lovvorn, Esq.  
*Animal Protection Litigation*  
Kathleen C. Milani  
*Investigations and Video*  
Miyun Park  
*Farm Animal Welfare*  
Nancy Perry, Esq.  
*Government Affairs*  
Robert G. Roop, Ph.D., SPHR  
*Human Resources &  
Education Programs*  
Melissa Seide Rubin, Esq.  
*Field & Emergency Services*  
John M. Snyder  
*Companion Animals*  
Martin L. Stephens, Ph.D.  
*Animal Research Issues*

**DIRECTORS**

Leslie Lee Alexander, Esq.  
Patricia Mares Asip  
Peter A. Bender  
Eric L. Bernthal, Esq.  
Barbara S. Brack  
Anita W. Coupe, Esq.  
Neil B. Fang, Esq., C.P.A.  
Jane Greenspun Gale  
Jennifer Leaning, M.D., S.M.H.  
Kathleen M. Linehan, Esq.  
Dwight E. Lowell II  
William F. Mancuso  
Mary I. Max  
Patrick L. McDonnell  
Gil Michaels  
Judy Ney  
Sharon Lee Patrick  
Judy J. Peil  
Marian G. Probst  
Joshua S. Reichert, Ph.D.  
Marilyn G. Seyler  
Walter J. Stewart, Esq.  
John E. Taft  
Andrew Weinstein  
Persia White  
David O. Wiebers, M.D.

Docket Clerk  
U.S. Department of Agriculture  
Food Safety and Inspection Service  
George Washington Carver Center, Room 2-2127  
5601 Sunnyside Avenue  
Beltsville, MD 20705-5272

**Re: Docket ID No. FSIS-2011-0012, Modernization of  
Poultry Slaughter Inspection Rule**

The Humane Society of the United States (HSUS) submits the following comments on the proposed rulemaking regarding inspection of poultry carcasses in federally-inspected slaughter facilities, as addressed in FSIS Docket ID No. FSIS-2011-0012, Modernization of Poultry Slaughter Inspection Rule. *See* 77 Fed. Reg. 4407 (Jan. 27, 2012) ("Proposed Rule"). As explained below, there are major legal failings in the proposed rule. The comments below focus on two flaws: the complete failure to address humane slaughter issues and the legal insufficiency of the agency's environmental impact statement.

**I. The Proposed Rule Unlawfully Fails to Explain A  
Deviation from FSIS Policy Regarding Humane  
Slaughter**

The Proposed Rule, along with FSIS' follow-up April 26, 2012 Federal Register notice, wholly fail to address any animal welfare implications of the Proposed Rule. This is a profound failure, not only because the rule has the potential to negatively impact literally billions of birds who will be slaughtered annually in the U.S., but because the agency has expressly linked inhumane poultry slaughter with an increased risk of adulterated product. The proposed rule's analyses and conclusions regarding adulteration risks are therefore deficient because FSIS arbitrarily failed to address this connection between inhumane slaughter and food safety as it relates to the likely increase in the speed of the stunning and slaughter process made possible by this rule.

As an initial matter, The HSUS encourages FSIS to revisit the humane slaughter issue and to, at minimum, encourage transition to compressed atmosphere killing slaughtering systems. Such systems are far more humane and, as explained in the attached paper, they would thus eliminate much of FSIS' concern regarding the correlation between inhumane poultry slaughter and adulterated product.<sup>1</sup>

FSIS expressly links inhumane slaughter to regulatory noncompliance, and increased adulteration and therefore it cannot reasonably ignore the Proposed Rule's impact on the prevention of inhumane slaughtering. Here, the Proposed Rule's stated objectives are: To improve food safety; and to remove regulatory burdens from the slaughter industry (i.e., to improve efficiency and profitability of the slaughtering industry.)<sup>2</sup> Having put in place policies, directives, and notices all aimed at minimizing the cruelty and attendant food safety threats in the slaughter process, the agency is not free to simply ignore this aspect of the slaughter process as it apparently has done here.

As other commenters have pointed out in this administrative record, there is every reason to expect that allowing line speed increases for post-scald lines will effectively allow and, indeed, encourage speeding up all aspects of the slaughter process, including live hang, stunning and slaughtering at many if not most facilities. Nothing in the Proposed Rule contradicts this logical assumption. But the Proposed Rule does not attempt to explain how speeding up the already incredibly fast slaughter and stunning process can possibly accommodate the agency's required systematic approach to monitoring these processes to promote humane slaughter and thereby minimize food safety threats. This sort of humane slaughter inspection is precisely what FSIS has long required of its inspectors during every single slaughtering shift at every inspected poultry slaughter plant.

For example, FSIS documents confirm that detecting inhumane poultry slaughtering is a "critical" part of the agency's inspectors' jobs:

In poultry operations, employing humane methods of handling and slaughtering that are consistent with good commercial practices increases the likelihood of producing unadulterated product. FSIS regulations describe the operating procedures

---

<sup>1</sup> See Shields, Raj, *An HSUS Report: The Welfare of Birds at Slaughter*, attached, and available at <http://www.humanesociety.org/assets/pdfs/farm/hsus-the-welfare-of-birds-at-slaughter.pdf> (last accessed May 27, 2012).

<sup>2</sup> Proposed Rule at p. 4408, 4438 ("The lower production costs may also lead to increased sales of domestic and exported products in the long run. We estimate these economic benefits to be at least \$258.9 million.") (emphasis added).

that poultry processors must follow to ensure sanitary processing, proper inspection, and the production of poultry products that are not adulterated. Under 9 CFR 381.71, FSIS condemns poultry showing, on antemortem inspection, certain diseases or conditions. Bruising is one condition that may result in condemnation (9 CFR 381.89). Bruises are likely to result when birds are not treated humanely. Moreover, the PPIA (21 U.S.C. 453(g)(5), as well as agency regulations (9 CFR 381.90), provide that carcasses of poultry showing evidence of having died from causes other than slaughter are considered adulterated and condemned. The regulations also require that poultry be slaughtered in accordance with good commercial practices, in a manner that results in thorough bleeding of the poultry carcass, and ensures that breathing has stopped before scalding so that the birds do not drown (9 CFR 381.65(b). Compliance with these requirements helps ensure that poultry are treated humanely. The PHV or IIC on a daily, per shift basis, when the establishment slaughters; will systematically observe the conditions in the pre-scald areas. They will be checking for mistreatment of birds or handling them in a way that will cause death or injury or prevent thorough bleeding or result in excessive bruising. FSIS Directive 6100.3 outlines the procedures that the PVH or IIC should take when they make these observations. As an on-line inspector, it will be critical to notify the PHV when you observe cadaver birds at the post-mortem inspection station. The evidence of bright red cadaver birds means that the birds will still breathing prior to entering the scald vat. This indicates that the establishment is not adhering to good commercial practices and will result in the PHV documenting the noncompliance. You play a critical role in verifying good commercial practices by communicating your findings at the post-mortem inspection station to the PHV.<sup>3</sup>

Implicit in the statement above, is that even at present speeds, inspectors must try to vigilantly inspect the process because this industry is sending

---

<sup>3</sup> FSIS, Poultry Postmortem Inspection 3-17-09 at p. 5, available at [http://www.fsis.usda.gov/pdf/psit\\_postmortem.pdf](http://www.fsis.usda.gov/pdf/psit_postmortem.pdf) (last accessed May 27, 2012) (emphasis added) (last accessed May 27, 2012); *see also* FSIS Directive 6910.1 rev. 1 (Dec. 12, 2009) (“[] during the review, the DVMS will be assessing whether or not a systematic approach is being applied by the establishment to ensure that poultry are handled and slaughtered in a manner that is consistent with good commercial practice.”)

live, breathing birds into tanks of scalding water. As noted above, the entire slaughter process is likely to speed up in many facilities once post-scald lines speed up as companies take advantage of this Proposed Rule's goal of increasing output. Accordingly, the agency needs to offer a reasoned explanation of how it will be possible for inspectors in the "pre-scald area" to "systematically observe" 3 or more birds per second "[ ] checking for mistreatment of birds or handling [ ] that will cause death or injury or prevent thorough bleeding or result in excessive bruising."<sup>4</sup> It is far from self-evident, especially given the tacit admission above that even at present speeds FSIS and this industry somehow cannot manage to prevent conscious birds from regularly being dunked into vats of scalding water despite FSIS' understanding that such cruelty increases adulteration risks.

As a matter of common sense, at some point a process will be moving so quickly that "systematic" observation of these processes during every operating shift—which FSIS deems to be "critical"—is simply impossible. The evidence above, standing on its own, strongly suggests the process is already far too fast to allow for systematic inspection, and FSIS offers no reasoned explanation for why speeding it up will not make compliance with mandatory "commercial best practices" as required by FSIS regulations, directives and notices completely impossible.

In sum, the agency was legally obligated to explain at least the following obvious questions:

1. What is the anticipated scope of pre-scald line-speed increases? In other words, how many plants are likely to speed up pre-scald lines in response to the Proposed Rule?
2. How is it possible to systematically inspect humane slaughter practices at plants with line speeds that would require inspectors to observe birds hung, stunned and killed at a rate of up to 3 birds per second?
3. How does the inability to systematically inspect birds for mistreatment impact each of the Proposed Rule's analyses and conclusions regarding adulteration risks in facilities operating at faster line speeds?

As noted above, the Proposed Rule offers no insight on these critical questions because the rule does not address any humane slaughter implications at all.

If FSIS wants to abandon its settled policies, regulations and directives concerning humane poultry slaughter and good commercial practices related

---

<sup>4</sup> *Id.* citing FSIS Directive 6100.3.

thereto, it is free to do so if it offers a reasoned explanation therefore. It is not free to do as it has done here, which is to silently pretend that one critical aspect of the slaughter inspection process that has an acknowledged impact on food safety is now simply a non-issue. “An agency cannot ignore a substantial diversion from its prior policies.” *See Ramaprakash v. FAA*, 346 F.3d 1121, 1124 (D.C.Cir.2003) (agency must “provide a reasoned analysis indicating that prior policies and standards are being deliberately changed, not casually ignored”); *Nat’l Cable & Telecomms. Ass’n v. Brand X Internet Servs.*, 545 U.S. 967, 981, 125 S.Ct. 2688, 162 L.Ed.2d 820 (2005) (“unexplained inconsistency” in agency practice is a reason for holding a policy reversal “arbitrary and capricious” under the APA, unless “the agency adequately explains the reasons for a reversal of policy”). This is a significant legal failing, and if the agency does not revisit this issue, and provide reasoned answers to the questions above the rule will be extremely vulnerable to legal challenges.

## **II. The Proposed Rule’s Environmental Impact Analysis is Legally Deficient**

The Proposed rule fails to satisfy the requirements of the National Environmental Policy Act (“NEPA”). The environmental impacts of the Proposed Rule at the local, state, and nationwide level have the potential to be significant. In a few short paragraphs on these impacts, the Proposed Rule improperly relies on anticipated compliance with dozens of differing, potentially conflicting environmental laws as an indicator that environmental impacts of the rule will be insignificant. Instead of addressing environmental impacts as NEPA requires, the agency glosses over the cumulative impact potential and does not even bother to address more localized impacts of the Proposed Rule. In addition, FSIS invokes a categorical exemption to NEPA, yet it improperly fails to analyze whether an exception to that exemption may apply here.

Indeed, under the Council on Environmental Quality (“CEQ”) regulations, the adoption of a new federal regulatory scheme, but for which various potentially significant environmental impacts would not occur, would appear to demand a full-fledged Environmental Impact Statement (“EIS”), although USDA has failed to prepare even a more cursory Environmental Assessment (“EA”). Hence, the CEQ regulations provide that the assessment of whether environmental impacts are “significant” – and thus should be evaluated in an EIS – “requires considerations of both context and intensity.” 40 C.F.R. § 1508.27. Importantly, “context” “means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region . . . and the locality.” *Id.* at § 1508.27(a) (emphasis added); *see also Anderson*, 371 F.3d at 492 (determining that an

EIS was required regarding a whale hunt because, although the hunt would not impact the overall gray whale population, there were “substantial questions’ as to the significance of the effect on the *local* area”) (italics in original). “Intensity” “refers to the severity of impact,” and requires consideration of various factors that agencies must address in evaluating whether impacts are sufficiently serious to warrant preparation of an EIS. 40 C.F.R. § 1508.27(b).

Based on these criteria, this Proposed Rule appears tailor made for an EIS. Indeed, although “courts have found that ‘[t]he presence of one or more of [the CEQ significance] factors should result in an agency decision to prepare an EIS,’” *Fund for Animals v. Norton*, 281 F. Supp. 2d 209, 218 (D.D.C. 2003), and that an EIS should be prepared on an action that may be significant in either a national or a local context, *Anderson*, 371 F.3d at 492, in this instance, many of the CEQ criteria for significance are implicated, and the action under review affects both “society as a whole,” as well as the “localit[ies]” where the specific slaughter plants are located. 40 C.F.R. § 1508.27(a). First, as described below the action plainly “affects public health or safety,” 40 C.F.R. § 1508.27(b)(2), since, once again, but for the Proposed Rule, slaughter facilities could not ramp up their operations and slaughter more animals, thereby increasing demand on water supplies and the danger of spills or other water contamination. *See, e.g., Tomac v. Norton*, 240 F. Supp. 2d 45, 51 (D.D.C. 2003) (finding EA inadequate because it did not adequately address impact of decision on “air and water” quality in affected area). Second, by the same token, the action entails “unique or unknown risks,” *id.* at § 1508.27(b)(5), since, although there is evidence that communities near slaughter facilities may experience water shortages and pollution due to increased slaughter operations facilitated by this Proposed Rule, no NEPA document has ever analyzed the actual health “risk” that this pollution poses to any community. *Id.* Finally, “the effects” of the rule “on the quality of the human environment” are certainly “highly controversial,” *id.* at § 1508.27(b)(4), as extensive national and local media coverage of this Proposed Rule makes obvious.

#### **A. FSIS Improperly Invokes a Categorical Exemption without Fully Analyzing its Applicability Here**

In the Proposed Rule, FSIS improperly invokes a categorical exemption to NEPA, without addressing any possible exceptions to that exemption which may apply here. Particularly where, as here, there are indicia that an agency action may indeed entail environmental impacts that would otherwise go unstudied, reviewing courts deem categorical exclusion claims “deficient [if] [the agency] fails to explain why [the action] does not fall within an exception to the categorical exclusions.” *Jones*, 792 F.2d at 828; see also

*Riverhawks v. Zepeda*, 228 F. Supp. 2d 1173, 1190 (D. Or. 2002) (agency improperly invoked its categorical exclusion and violated NEPA by failing to “negate the presence of extraordinary circumstances” before proceeding with its proposed action) (emphasis added); *Greenpeace U.S.A. v. Evans*, 688 F. Supp. 579, 585 (W.D. Wash. 1987) (ruling for plaintiff where agency “provided no reasoned explanation – indeed, no explanation at all – of how [mitigating] conditions would prevent application of an exception to the categorical exclusions”); *Alaska State Snowmobile Ass’n, Inc. v. Babbitt*, 79 F. Supp. 2d 1116, 1136-37 (D. Alaska 1999) (agency “abused its discretion” by merely “restat[ing] the categorical exclusion,” and holding that the agency should, “at a minimum, explain its decision that no exceptions applied”), vacated as moot on other grounds, 2001 WL 770442, at \*1 (9th Cir. Jan 10, 2001).

In this case, however, although USDA was certainly taking an extraordinary action – i.e., adopting rules that are likely to increase poultry slaughter by millions of birds per year and at slaughter facilities throughout the nation – the Proposed Rule contains no hint that USDA ever even considered whether the “extraordinary circumstances” criteria applied to its decision. The local, regional and national environmental impacts of the rule, on just two aspects of the Proposed Rule’s environmental impact: water pollution and over-use of water are discussed below. But notably, the Proposed Rule does not show that FSIS has undertaken any environmental review whatsoever. As a result, the pertinent case law compels the conclusion that USDA has, but has failed to sustain, the burden of demonstrating that it may invoke a categorical exclusion here.

**B. The Proposed Rule’s Potential to Seriously Negatively Impact Fresh Water through Increased Potential for Dangerous Discharges and Increased Use of Scarce Fresh Water**

According to the Proposed Rule, there are currently 663 slaughter lines operating daily in “270 young chicken and turkey establishments with one or two 8-hour shift(s), on about 5 or 6 days of the week.”<sup>5</sup> FSIS conservatively estimates that reducing current restrictions on line speeds will result in an increase of an average of 6 percent for the line speed.<sup>6</sup> Moreover, FSIS estimates the economic benefits of the proposed rule’s allowance for faster slaughter facility processing will be “at least \$258.9 million (3 cents per bird for 99.9 percent of 8.64 billion birds) annually.”<sup>7</sup> Thus, in line with the Proposed Rule’s reliance on Executive Order 13563, FSIS estimates the

---

<sup>5</sup> Proposed Rule at p. 4436.

<sup>6</sup> Proposed Rule at p. 4438.

<sup>7</sup> *Id.*

Proposed Rule will spur greater productivity, causing more birds to be slaughtered at 99.9 percent of U.S. slaughter facilities.

The industry presently slaughters 8.64 billion birds per year. *Id.* Despite the foregoing, in its environmental review discussion, the agency disingenuously suggests that not that many more birds will actually be slaughtered cumulatively. In doing so, the agency makes vague statements such as “by allowing establishments to reduce their hours of operations, the faster line speeds permitted under this proposed rule will result in a small, if any, increase in water use or runoff by establishments that operate under the New Poultry Inspection System.” First, the agency’s assumption that poultry slaughter operations will opt to reduce hours is utterly unfounded and arbitrary, and cannot be reconciled with another claim in the same paragraph: “expected sales of poultry products will determine the number of birds that poultry establishments slaughter.” The agency does not grapple with the impact of high and increasing “expected sales” which would obviously magnify the impact of the rule. In effect, the agency bizarrely seems to assume that despite the massive effort that went into the Proposed Rule, and its reliance on an executive order aimed at maximizing efficiency and productivity that the poultry industry will not be slaughtering more birds as a result of the rule.

The agency is not free to posit only those hypotheticals that it thinks may help it avoid engaging in NEPA review. Rather it must take a hard look at what happens if this rule works as the agency intends it to: regulatory limits are relaxed and more birds are slaughtered. *Center for Biological Diversity v. Nat’l Highway Traffic Administration*, 538 F.3d 1172, 1220 (9<sup>th</sup> Cir. 2008) “If an agency decides not to prepare an EIS, it must supply a convincing statement of reasons to explain why a project’s impacts are insignificant. The statement of reasons is crucial to determining whether the agency took a hard look at the potential environmental impact of a project.”) (Internal quotations removed).

There are compelling reasons to believe more birds will be slaughtered in response to this Proposed Rule and as global demand for poultry products may increase. To take one example, powerful poultry industry trade groups are presently working with the federal government to open up India as a market for U.S. Poultry products. Indeed, the National Chicken Council hopes to achieve that end as soon as possible and it states that “[b]y conservative estimates, if India’s trade barriers were eliminated, the value of

U.S. poultry exports to India each year would surpass \$300 million.”<sup>8</sup> Because the environmental impact analysis in the Proposed Rule fails to consider predictable increases in the number of birds slaughtered, it falls short of NEPA’s requirements.

There can be no reasonable dispute that the more than 200 existing federally inspected poultry slaughter facilities have collectively and individually the potential to pollute fresh water. EPA studies have shown that pollutants including oil and grease, fecal coliforms, ammonia as nitrogen, and total nitrogen have been “[ ] detected in the untreated wastewater” of poultry slaughter facilities “at treatable levels in a significant number of samples, typically five times the baseline value in more than 10 percent of the untreated wastewater samples.”<sup>9</sup> Additionally, studies have shown that water coming into contact with chicken excrement can contain bacteria capable of causing serious human illness, including multi-drug resistant *E. coli*, *Campylobacter*, and the leading cause of food poisoning-related death, *Salmonella*, which is a growing problem in the United States.<sup>10</sup>

Based on the flawed premise that increases in the number of birds slaughtered nationwide will be “small,” the Proposed Rule assumes little to no increased water pollution as a result of the changes it makes. This is legally deficient because it includes no analysis regarding how increased slaughter may impact water pollution and effect local communities near such facilities, entire regions, and the national environment as a whole. See *Center for Biological Diversity*, 538 F.3d at 1223 (finding EA deficient where agency failed to supply “any analysis or supporting data” supporting conclusion that “a small reduction (0.2% compared to baseline) in the growth of carbon emissions would not have a significant impact on the environment”). Moreover, even if in general slaughter rates do not increase nationwide, the rule wholly fails to analyze more particularized impacts on any given state or

---

<sup>8</sup> National Chicken Council press release, *India Fails to Lift Restrictions on US Poultry in Consultations*; USTR Requests Formation of WTO Dispute Settlement Panel (May 11, 2012) available at <http://www.nationalchickencouncil.org/india-fails-to-lift-restrictions-on-us-poultry-in-consultations-ustr-requests-formation-of-wto-dispute-settlement-panel/> (last accessed May 29, 2012).

<sup>9</sup> EPA, Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432), EPA-821-R-04-011, available at [http://water.epa.gov/scitech/wastetech/guide/mpp/upload/2008\\_07\\_15\\_guide\\_mpp\\_fin\\_al\\_tdd07.pdf](http://water.epa.gov/scitech/wastetech/guide/mpp/upload/2008_07_15_guide_mpp_fin_al_tdd07.pdf) (last accessed May 29, 2012).

<sup>10</sup> Chai, S. J., et al. 2012. *Salmonella enterica* Serotype Enteritidis: Increasing Incidence of Domestically Acquired Infections. *Clinical Infectious Diseases* 54: S488–97.

community as individual plants or segments of the industry increase slaughter rates.

In addition, the present rule fails to mention let alone analyze increased chicken slaughter's potentially massive impact on water use. USDA is well aware that poultry slaughter is an immense drain on water supplies. Indeed the agency's own publications report that

[i]t takes an average of 7 gallons of water to process each bird. The southeastern part of the United States is struggling to meet the water needs of its residents, and water costs are at a premium. 'In 2005, some poultry processing plants in the South had to cut back on the number of birds they processed because water was not available. The drought has encouraged the privatization of water, with new companies being developed just to sell one of our most precious natural resources,'<sup>11</sup>

The EPA has found that chicken slaughter plants can use more than 9 gallons per bird and they generate more waste water per live-weight pound than even cattle and pig slaughterhouses:

Using the reported mean live weight per bird of 3.83 pounds, 9.3 gallon per bird translates into 2,428 gallon per 1,000 lb LWK, which is significantly higher than the mean flow of 639 gallon per 1,000 lb LWK used for meat processing. For 34 turkey processing plants, the mean wastewater flow was 31.2 gallon per bird with individual plant values ranging from 9.6 to 71.4 gallon per bird. Again, no standard deviation was reported. Based on the reported mean live weight per bird of 18.2 pounds, the mean flow of 31.2 gallon per bird translates into 1,714 gallon per 1,000 lb LWK. Again, this value is substantially higher than that for meat processing, but also substantially lower than the value calculated for chickens.<sup>12</sup>

---

<sup>11</sup> *Chillin Chickens Which method Works Best*, Agricultural Research, April 2008 <http://www.ars.usda.gov/is/ar/archive/apr08/chicken0408.pdf> (last accessed May 27, 2012) (emphasis added).

<sup>12</sup> EPA, Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432), EPA-821-R-04-011, at p. 6-7, 6-8 available at [http://water.epa.gov/scitech/wastetech/guide/mpp/upload/2008\\_07\\_15\\_guide\\_mpp\\_final\\_tdd06.pdf](http://water.epa.gov/scitech/wastetech/guide/mpp/upload/2008_07_15_guide_mpp_final_tdd06.pdf) (last accessed May 29, 2012). In the same document, EPA also points out, that poultry slaughter waste water may contain "[ ] pathogens of enteric origin, such as *Salmonella sp.* and *Campylobacter jejuni*, gastrointestinal parasites, and pathogenic enteric viruses.)

From this, it follows that increasing the number of birds killed increases the demand on already limited water supplies, and increases the amount of wastewater generated. Aside from the bald conclusion that FSIS doesn't expect individual or cumulative environmental impacts, the agency does not address the implications of these facts as applied to its proposed rule.

EPA's studies of water use at poultry slaughter facilities also directly undermines FSIS' unsupported conclusion here that industry-wide changes in poultry slaughter practices will universally not have individual or cumulative environmental impacts. EPA has explained that such sweeping generalizations regarding poultry slaughter wastewater are not supportable, not that FSIS even attempted to support them here. Thus EPA has stated that

“[] the results obtained in these sample episodes in combination with other sources of information suggests that there is a considerable degree of variation among facilities even within each segment of the industry in both the volume of wastewater generated per unit of production and the concentrations of specific pollutants.” The sampling episode results demonstrate that the differences between two facilities with the same activity such as only first processing of broilers or first processing of cattle with on-site rendering and hide processing can be substantial. This suggests that differences in-plant waste management practices, such as minimizing water use and separate collection of solid wastes, are critical factors in determining the volume of wastewater and the masses of individual pollutants generated per unit of production. Thus, it seems reasonable to conclude that any mean or median values characterized as typical values probably will describe the wastewater generated at a relatively small fraction of the total number of facilities in each segment of the MPP industry.<sup>13</sup>

Against this backdrop, the agency's sweeping, generalized and conclusory claims that the Proposed Rule “will not have a not have a significant individual or cumulative effect on the human environment” ring hollow.<sup>14</sup> The Agency has arbitrarily ignored the local, regional and nationwide impacts on water supplies associated with increased chicken slaughter at virtually every federally inspected poultry slaughter facility. In addition, the

---

<sup>13</sup> *Id.* at pp. 6-19, 6-20.

<sup>14</sup> Proposed Rule at 4451.

rule fails to address other cumulative impacts, such as increased truck traffic to and from slaughter facilities resulting from increased slaughtering. To meet the minimum requirements of NEPA, the agency must at least attempt to explain each of these impacts, and support its conclusion of no significant impact with a reasoned analysis.

### **C. FSIS' NEPA Analysis Improperly Relies on Hoped-For Industry-wide Compliance with Environmental Laws**

The agency will not be able to sustain the Proposed Rule's conclusion that "poultry slaughter establishments are required to meet all local, State, and Federal environmental requirements. Thus, FSIS has determined that allowing establishments to operate under faster line speeds provided in the proposed PSR will not have a not have a significant individual or cumulative effect on the human environment."<sup>15</sup> Obviously, virtually every single entity regulated by the federal government must likewise "meet all local, State, and Federal environmental requirements." If that was all it took for an agency to avoid NEPA review on a rule that affected hundreds of facilities and communities scattered around the country, then NEPA would be a paper tiger. In addition, The Agency fails to account for how varying state and local laws may affect environmental impacts throughout the U.S. In other words, what may not be regulated as an environmental impact by one state or local community may well be so regulated by another. For example, as the Washington Post reported:

"Companies have also taken advantage of loopholes in regulations. Perdue, the country's second-largest chicken producer, trucks millions of gallons of waste a year from its Delaware slaughterhouses into Maryland, where the loads are injected into fields. Delaware limits such dumping, but Maryland does not."<sup>16</sup>

Thus, invoking hoped-for compliance with dozens of differing local and state laws does not provide any sort of consistent means of assessing environmental impacts as NEPA requires where, as here, a rule will affect hundreds of facilities operating in many different jurisdictions throughout the U.S. Accordingly, hoped-for compliance with other environmental laws is not a legally sufficient justification for avoiding NEPA environmental review here. *See Manatee County v. Gorsuch*, 554 F. Supp. 778 (M.D. Fla. 1982)

---

<sup>15</sup> *Id.*

<sup>16</sup> Peter S. Goodman, *An Unsavory Byproduct: Runoff and Pollution*, Washington Post, A1 (Aug. 1, 1999) available at <http://www.washingtonpost.com/wp-srv/local/daily/aug99/chicken1.htm> (last accessed May 28, 2012).

(NEPA was violated during ocean dumping actions by EPA under the Marine Protection, Research and Sanctuaries Act).

### **III. Conclusion**

For the reasons stated above, the HSUS respectfully Requests that FSIS set aside the Proposed Rule or amend it to address the serious shortcomings discussed above.

Respectfully Submitted, May 29, 2012

/s/

---

Peter A. Brandt  
Senior Attorney, Farm Animals  
The Humane Society of the United States  
2100 L St. N.W.  
Washington, DC 20037

Attachment to HSUS Comments on:

**Docket ID No. FSIS-2011-0012, Modernization of Poultry Slaughter Inspection Rule**

## **An HSUS Report: The Welfare of Birds at Slaughter**

**Sara Shields, Ph.D.,\* and Mohan Raj, Ph.D.†**

### **Abstract**

The customary slaughter method of birds killed for human consumption involves the stunning of several live birds at one time using electrical water baths supplied with constant voltages. The birds are hung upside-down on shackles prior to conveyance through the electrified bath. This system, which is used globally, is increasingly under scrutiny as research suggests that it can be both inhumane and ineffective. Scientists have demonstrated that handling, inversion, and shackling are traumatic and stressful to birds and that shackling itself may be painful. In some cases, birds may also receive painful pre-stun electric shocks. There is growing evidence that the existing electrical water-bath stunner settings, including those used in U.S. slaughter plants, may not render birds immediately unconscious. Further, birds may miss the stunner completely and remain conscious when their throats are cut and possibly when they reach the scald vat. Since the existing, constant voltage, electrical water-bath systems that involve stunning several birds simultaneously are increasingly considered inhumane, alternative technologies that use gas mixtures to render birds unconscious have been developed to improve animal welfare. To date, the most effective and least aversive method of stunning birds prior to slaughter is Controlled Atmosphere Killing (CAK), which rapidly and efficiently gasses birds while they are in transport crates.

### **Introduction**

In 2007, more than 9 billion birds were slaughtered for food in the United States alone.<sup>1</sup> The vast majority, overwhelmingly chickens,<sup>‡</sup> are first hung upside-down on metal shackles by their legs and then stunned using an electrified water-bath system before they are killed. Stunning is practiced in order to render birds unconscious and insensible, and to immobilize them before slaughter.<sup>2,3</sup> However, there is growing concern that stunning several birds at any one moment using an electrified water bath supplied with a constant voltage is inhumane, as birds experience stress and pain before, during, and sometimes after this process.

Newer systems, including Controlled Atmosphere Stunning (CAS) and Controlled Atmosphere Killing (CAK) methods employing naturally occurring gases, are increasingly seen as better alternatives for improved animal welfare, worker conditions, and carcass quality.<sup>§</sup> Despite the fact that birds make up more than 95% of all land animals slaughtered for food in the United States,<sup>4,5</sup> at present, the U.S. Department of Agriculture (USDA) does not include them under the protections of the Humane Methods of Slaughter Act of 1958.<sup>6</sup>

---

\* Dr. Shields serves as a consulting farm animal welfare scientist for the Humane Society of the United States.

† Dr. Raj is a Reader in Farm Animal Welfare at the University of Bristol, School of Veterinary Science, and the world's leading expert on the slaughter of birds for human consumption.

‡ As chickens are the species slaughtered in the greatest number both globally and in the United States, they will be the focus throughout this paper, although some discussion of the welfare of turkeys during slaughter will also be included.

§ The terms CAS and CAK are sometimes used interchangeably, but it is imperative that birds do not regain consciousness while on the shackle line. Therefore, CAK systems, which eliminate this potential, are highly preferred and will be the focus throughout this paper.

## Electrical Water-Bath Stunning

Multiple-bird electrical water-bath stunning is the most common pre-slaughter stunning method under commercial conditions where large throughput rates are required—i.e., in countries where poultry slaughter and processing are partially or fully mechanized. Most birds arrive at the slaughter plant in transport crates (or modules) on trucks, are unloaded onto a conveyer belt, hung upside-down in metal shackles, and conveyed through the electrical water-bath stunner, their heads passing through the electrically charged water. The animals are then killed by automated knife cut to the throat and subsequent exsanguination. Following the bleed-out process, birds enter the scald tank in preparation for the next step, mechanical plucking of feathers. The United States has one of the fastest throughput rates, with some line speeds as fast as 140-180 birds per minute.<sup>7</sup>

When birds pass through the electrified water bath, current flows in the direction of head to feet, through the whole body towards the shackle line, which is grounded (in contact with the earth). When correctly applied, electrical stunning stimulates the brain with an electric current of sufficient magnitude to induce generalized epilepsy and is thought to be accompanied by unconsciousness and insensibility.<sup>8</sup> However, there are many welfare problems associated with the process of uncrating and shackling live birds, and the operation of existing multiple-bird electrical water-bath stunning technology. These bird welfare concerns are global in nature, applicable to all parts of the world, including the United States, where chicken slaughter is highly mechanized.

### Uncrating

In developed countries, chickens are transported to processing plants in one of two types of modules. In one system, common in the United States, birds are tipped out of their transport crates upon arrival at the slaughter plant. During this process, forceful ejection of birds by “thumping” the modules or removing uncooperative individuals with a metal bar can cause bruising and lacerations.<sup>9</sup> Additionally, if chickens are dumped at a faster rate than hanging operators can shackle them, crowding and smothering on the supply belt can occur.<sup>10</sup> The process of removing birds from crates is undoubtedly traumatic, and birds are likely to experience fear and distress.

### Shackling

Prior to electrical water-bath stunning, chickens must be shackled. While metal shackles are uniform, the leg sizes of chickens vary. Hanging operators may use considerable force to pull thick shanks into narrow shackles,<sup>11,12</sup> and birds may struggle violently if their legs do not fit properly.<sup>13</sup> Bruising of the surface of leg muscles occurs.<sup>14</sup> Tight-fitting shackles may provide good electrical contact between the legs and metal shackles but increase the severity of the pain associated with shackling. Evidence that shackling, in general, is painful is based on the presence of nociceptors (pain receptors) in the skin over the legs of birds and the close similarities between birds and mammals in nociception.<sup>15,16</sup> This pain is likely to be worse in birds suffering from diseases or abnormalities of leg joints or leg bones,<sup>17,18</sup> especially those with dislocated joints or bone fractures induced by rough handling during catching, crating, and uncrating.<sup>19</sup> Moreover, hanging upside-down is a physiologically abnormal posture for chickens. Handling, inversion, and shackling are traumatic and stressful, as reported in multiple studies that measured physiological indicators of stress.<sup>20,21,22,23</sup> Because of this, approximately 90% of birds flap their wings vigorously,<sup>24</sup> which may lead to dislocated joints and broken bones.<sup>25</sup>

### Pre-Stun Electric Shocks

It is well-documented in the scientific and trade literature that some birds inadvertently experience painful electric shocks prior to being stunned in the electrified water bath.<sup>26,27,28,29,30</sup> This can happen when a bird's leading wing makes contact with the water before the head or if wing-flapping occurs at the entrance to the stunner.<sup>31</sup> Turkeys are especially prone to pre-stun shocks,<sup>32</sup> because their wings hang lower than their heads when hung inverted on a shackle.<sup>33</sup> In a survey of six different turkey slaughter plants in the U.K., pre-stun electric shocks were observed in five facilities.<sup>34</sup> In this study, the average number of turkeys receiving electric

shocks prior to stunning was 43%, with some plants reaching up to 87%. In some slaughter plants, pre-stun shocks occurred because the ramp at the entrance to the stun bath was electrically live,<sup>35</sup> although modifications to the entry ramps of chicken stunners may prevent overflow of electrically charged water.<sup>36</sup> However, the prevalence of such entry ramp designs in commercial slaughter plants globally, including within the United States, is not known. It has been suggested that fast line speeds are less likely to produce pre-stun shocks in turkeys, because the wing and head are immersed in the water bath together,<sup>37</sup> yet faster line speeds, as discussed herein, present separate welfare concerns.

## Ineffective Stunning

Ineffective stunning of birds in the electrical water-bath system is a global concern. Recent scientific evidence published in 2006 and multiple studies conducted over the preceding few decades suggest that electrical water-bath stunning may not be instantaneous or effective in all the birds. Although it is theoretically possible to induce immediate unconsciousness using electricity of sufficient magnitude, evidence that this occurs in commercial practice is lacking, and the research published in 2006 suggests that the electrical settings currently in use in U.S. slaughter plants, which are becoming used more commonly in the rest of the world, may not render all birds immediately unconscious.<sup>38,39</sup> This is mainly because the precise settings needed to produce an instantaneous state of unconsciousness and insensibility are not easily achieved as control of all the biological and electrical variables in water-bath stunners is difficult.<sup>40</sup>

The criteria used to evaluate the effects of electrical stunning on birds also raise concerns. For example, brain functioning in sheep and pigs following electrical stunning has been investigated experimentally using electroencephalogram (EEG) recordings. Their EEG activity resembles grand mal epilepsy followed by a flat or isoelectric phase indicating unconsciousness.<sup>41</sup> However, scientific literature suggests that the EEG recordings of chickens following electrical stunning differ from those of mammals in that the epileptic activity more closely resembles a petit mal seizure, which is a milder form of epileptic attack in humans. These kinds of seizures are not associated with immediate unconsciousness in humans, leaving open the possibility that electrical stunning does not produce immediate unconsciousness in all birds.<sup>42,43,44,45</sup> Because the brain of a chicken responds to electrical stunning differently than a human's, however, the subjective experience of the bird during a petit mal seizure may also differ. When the occurrence of an epileptiform EEG recording is followed by a quiescent phase, this is thought to be a reliable indicator of unconsciousness and insensibility, and is used in studies of electrical stunning as a measure of the effectiveness of the stun.<sup>46,47</sup>

Although the electrical parameters of stun baths at poultry slaughter plants vary widely,<sup>48,49</sup> research suggests that commonly used settings in U.S. facilities may be inadequate to consistently produce an effective stun in all the birds. The typical wave form, pulse width, frequency, and current settings used in the United States are based on achieving good carcass and meat quality rather than on scientific evidence that they effectively produce unconsciousness and insensibility in every bird. Most of the U.S. broiler chicken industry implements a form of electrical stunning that involves application of a low current setting with a high frequency pulsed direct current (DC) and a reduced (short) pulse width.<sup>50,51,52,53</sup> Depending on the length of the water bath and the line speed,<sup>54</sup> the duration of the electric stun usually lasts 10-12 seconds.<sup>55</sup> The U.S. stunners may be set at 10-28 volts, delivering 10-45 mA per bird, and the frequency of the current varies between 350-500 Hz.<sup>56,57,58</sup> Although precise control of each of these electrical settings relative to the others is important, specific stun settings necessary for an effective and immediate stun are not mandated in the United States.

There has been very little research into the effectiveness of electrical settings commonly used in stun baths at U.S. poultry slaughter plants, but the results of research published in 2006 demonstrate that the parameters used might not render birds immediately unconscious or may not stun them effectively. Work at the University of Bristol's School of Clinical Veterinary Science by co-author Mohan Raj and his colleagues has demonstrated that the sine wave alternating current (AC) is more effective at producing EEG recordings indicative of unconsciousness and insensibility than the pulsed DC used in the United States.<sup>59</sup> The efficacy of stunning decreases as frequency increases,<sup>60</sup> and using either AC or DC, the amount of current necessary for an effective stun increases with the frequency of the current. Using a pulsed DC, it was found that electrical frequencies

above 200 Hz (as commonly found in U.S. slaughter plants) would require an average current greater than 200 mA in order to consistently induce epileptiform activity in EEG recordings.<sup>61</sup> This current is far greater than the 10-45 mA per bird often found in U.S. facilities.

Of further concern is that the pulse width of the DC is also an important factor affecting the likelihood that a stun will be effective. While longer pulse widths are more likely to produce epileptic EEG recordings, reduced pulse widths are common commercially.<sup>62</sup>

There is an inherent conflict between the requirement for effective electrical water-bath stunning and the production of a high-quality carcass and meat free of defects. While the probability of inducing an effective stun decreases as the frequency setting increases, low frequency settings cause intense muscle contraction and consequent rupture of small blood vessels in the skin and/or flesh, causing carcass defects that lead to downgrading.<sup>63</sup> Therefore, higher stunning frequencies (> 300 Hz) have become more prevalent<sup>64</sup> in U.S. slaughter plants<sup>65,66</sup> to ensure carcass and meat quality, despite the existing potential for an ineffective stun and/or for the bird to recover consciousness following stunning. However, even low frequency pulsed DC settings are questionable on animal welfare grounds, because some birds will experience cardiac arrest at stunning, yet fail to show EEGs indicative of effective stunning.<sup>67,68</sup> In general, there is an apparent conflict between bird welfare and meat quality under existing multiple-bird, electrical water-bath stunning, which cannot be resolved due to the complexity and inherent problems with the systems.

Induction of seizures (convulsions), rather than neurophysiological evidence (such as EEG recordings of generalized epilepsy), have been used to justify electrical stunning variables used in the broiler chicken industry.<sup>69</sup> In one study carried out in the U.K. that examined the effects of various current levels, all broiler chickens experienced seizures, whether or not they showed neurophysiological signs of unconsciousness and insensibility.<sup>70</sup> Similarly, in another study, all birds exposed to an average current of 44 mA developed spasms (also referred to in the literature as tremors or seizures) followed by complete muscle relaxation, whether or not their EEG recordings indicated unconsciousness.<sup>71</sup> The unavoidable conclusion one could draw from these results is that the existing electrical water-bath stunning procedures may induce seizures in conscious birds, which is potentially an extremely painful procedure.

The water bath may contain up to 20 birds at any one time.<sup>72</sup> In a constant voltage multiple-bird stunner, as is used commercially, the total current equals the sum of the currents flowing through each bird individually.<sup>73</sup> Variation in electrical resistance or impedance in the current pathway caused by natural variability among birds causes differences in the amount of current that individual birds receive as they pass through the water bath.<sup>74,75,76</sup> Bird variation can be due to many factors, including body size, body muscle and fat content, and plumage condition (e.g., whether the feathers are wet, dry, or dirty), depth of immersion, and the tightness of shackles.<sup>77,78,79</sup> Some birds do not receive a current of sufficient magnitude to stun them effectively.<sup>80</sup> Electrical variables also affect current flow. The mineral content, dirt, and brine concentration all affect the conductivity of the water bath.<sup>81,82</sup> Stunning birds using a multiple-bird electrified water-bath system is a complex task, and it is extremely difficult, if not impossible, to adequately control the process.<sup>83</sup> Therefore, improper stunning occurs with alarming frequency;<sup>84</sup> one study using an average current level that is common in U.S. slaughter plants (44 mA) showed that only 36% of chickens had EEGs indicative of effective stunning.<sup>85</sup>

Indeed, it is the current, rather than the voltage, that is the important factor for inducing an effective stun.<sup>86</sup> When the voltage is held constant, the amount of current delivered to each individual bird in the water-bath stunner is inversely related to the bird's resistance. As well, there is a delay in the passage of the correct current amount through the brain of the bird as the current rises, depending upon the electrical impedance or resistance in the pathway, from zero to the maximum level.<sup>87</sup> Therefore constant voltage stunners are inherently less efficient in inducing immediate unconsciousness.

At the low voltage and current levels used in the United States, this period during which the electrical impedance breaks down and unconsciousness is induced could be extremely painful.<sup>88</sup>

To overcome the problem of variable electrical impedance in multiple-bird water-bath stunners, constant current stunners have been developed in the U.K. but have not been implemented in the slaughter plants. These stunners control current flow through individual birds by electrically isolating each one to ensure that all birds in a multiple-bird water-bath stunner receive the minimum current needed for an adequate stun.<sup>89,90</sup> By controlling the current rather than the voltage, stunning can be achieved in 0.25 seconds, overcoming the delay in inducing unconsciousness that is characteristic of constant voltage systems.<sup>91</sup> However, because shackles are only 15 cm (5.9 in) apart on the line and because processing speed can be as high as 220 chickens per minute, there is considerable doubt that it is possible to electrically isolate each bird for long enough to deliver the pre-set current. As such, commercial application of these systems has been limited.<sup>92,93</sup>

Birds may not be adequately stunned if they flap their wings when entering the stunner, delaying or interrupting contact with the electrified water bath. When the depth or duration of the stun is not sufficient, birds may experience pain and distress when they reach the killing (neck-cutting) machine and during at least part of bleed-out.<sup>94,95</sup> This is clearly unacceptable from humanitarian and bird welfare standpoints.

Over the past few decades, researchers and veterinarians working independently have suggested that electrically stunned birds may not be unconscious at all when shocked in an electrified water bath, but rather in a state of electrical paralysis.<sup>96,97,98,99</sup> Prolonged application (three seconds or more) of insufficient current level may cause immobilization and prevent birds from displaying outward signs of pain, without rendering them unable to experience pain, stress, or discomfort.<sup>100,101</sup> Because birds may experience electrically-induced paralysis, seizures, and cardiac arrest while still conscious and because stunning may be delayed and/or ineffective, the existing electrical water-bath stunning system in and of itself cannot be considered humane.

### **Missing the Stun Bath**

Some birds are conveyed through the stunner without ever making contact with the electrified water bath itself, which is a global welfare problem. This can happen if birds struggle and lift their heads, if the height of the stunner is not correctly adjusted, or if birds are too short to reach the water bath.<sup>102,103,104</sup> Egg-laying hens whose productivity has waned, commonly referred to as “spent,” are especially prone to missing the stun bath as they are more likely to struggle in the shackles.<sup>105,106</sup> In 2007, one of the top disease challenges facing poultry veterinarians in the United States was Runt Stunting Syndrome (RSS) in broiler chickens. RSS-affected flocks have poor growth and lack uniformity in size, hindering the slaughter process,<sup>107</sup> possibly worsening the problem of small birds missing the stunner. Birds missing the stunner remain fully conscious when their necks are cut. There are no public records of the number of birds who miss the stunner in U.S. poultry slaughter plants. Advances in electrical water-bath design, such as the installation of rump bars to limit movement and breast rub pads to calm birds, may better prevent birds from missing the stun bath,<sup>108</sup> yet smaller birds (especially runts) may still reach the killing machine while fully conscious. Additionally, as RSS-affected birds would remain physically in contact with the adjacent birds passing through the stunner, the possibility that the RSS birds would receive painful electric shocks in a conscious state could not be ruled out.

### **Neck-Cutting**

Effectively stunned birds who have not undergone cardiac arrest at stunning must be killed quickly, otherwise they will regain consciousness.<sup>109</sup> The duration of a stun is dependent on the amount and frequency of the current.<sup>110</sup> Birds are in danger of regaining consciousness during bleed-out and of entering the scald vat while alive if the neck-cutting procedure is ineffective. A ventral cut, which severs both carotid arteries, is more effective at inducing a rapid death than a neck cut that severs only one carotid artery.<sup>111,112,113</sup> Unlike in the United States, ventral neck-cutting is not always practiced in some countries,<sup>114</sup> and, even in the United States, severance of both the carotid arteries in the necks of different sized birds is not always possible whilst using neck-cutting machines.

## Entering the Scald Tank Alive

Occasionally, live birds who were not adequately stunned and/or who missed the killing machine, or who recovered from the stun due to poor neck-cutting practices are live or conscious when entering the scald tank.<sup>115,116,117,118</sup> In the United States, U.K., and many other industrialized countries, a worker is present on the slaughter line to manually cut the throats of birds who miss the automated blade. However, in high-throughput slaughter plants, line speeds can prevent the detection of live birds exiting the killing machine.<sup>119</sup> In U.S. plants with improper supervision, the rate at which birds enter the scald tank while still alive may be as high as 3%.<sup>120</sup> According to the USDA's Food Safety and Inspection Service "Poultry Slaughter Inspection Training" guide, "Poultry that die from causes other than slaughter are condemned under the cadaver category. These birds are not dead when they enter the scald vat. When submerged in the hot water, they drown...."<sup>121</sup> In 2007 more than 1.5 million chickens and turkeys were condemned under this category.<sup>122</sup>

## Conclusions: Electrical Water-Bath Stunning

Historically, the development of electrical stunning devices was driven more by the need to facilitate processing and automation of slaughter than by concern for bird welfare.<sup>123</sup> Although water-bath stunning could theoretically produce a state of insensibility rapidly, the complexities of ensuring the correct electrical settings and the conflict between effective stunning and commercial interests in carcass and meat quality largely preclude these conditions in practice. However, the problem of dumping, handling, and shackling conscious birds remains, even if electrical variables could be satisfactorily controlled. Questions about the nature of the state of unconsciousness (or lack thereof) actually produced by electrical water baths raises further concerns about the system. In summary, the existing multiple-bird electrical water-bath stunning systems supplied with constant voltages are inadequate on welfare grounds as they do not ensure the least aversive slaughter possible.

## Controlled Atmosphere Killing (CAK)

CAK in transport crates or modules provides higher welfare as it does not require live bird handling at the slaughter plants, hence avoiding the problems associated with dumping,<sup>\*\*</sup> handling, and shackling live birds. As well, these systems do not risk pre-stun shocks and/or ineffective stunning. In the best CAK systems, birds in transport crates or modules are conveyed through a tunnel filled with increasing concentrations of carbon dioxide (CO<sub>2</sub>), inert gases (argon or nitrogen), or a mixture of these gases. With CAK, birds are exposed to lethal concentrations of gases long enough that they are actually killed, rather than simply stunned,<sup>124</sup> whereas with Controlled Atmosphere Stunning (CAS), the gas or gases induce unconsciousness as the birds pass through before they are hung on shackles, while insensible, and conveyed to the killing machine for slaughter. In either system, hanging operators do not shackle the birds until after they exit the gas stunning system, so the birds do not endure the pain, fear, and stress associated with this step in the conventional procedure.

Several different naturally occurring gases are used in CAK and CAS systems, and each has different physiological effects on the birds. Breathable air consists of approximately 21% oxygen (O<sub>2</sub>), 78% nitrogen (N), and 1% other gases (primarily argon, but with a small amount of CO<sub>2</sub>). When inhaled in high concentrations, the inert gases (argon and nitrogen) cause hypoxia or anoxia, which is oxygen deprivation in the body. The organ most sensitive to a physiologic decrease in blood oxygen levels is the brain, and unconsciousness and eventual death result when the oxygen level is insufficient for normal brain functioning. In contrast, elevated CO<sub>2</sub> levels cause hypercapnia, an increase in CO<sub>2</sub> levels in the blood, which disrupts respiration and normal neuronal function, leading eventually to death.

With CAS, the potential exists for birds to regain consciousness after exiting the gaseous atmosphere while being shackled and conveyed to the neck-cutter, or during bleeding. Therefore, it is imperative that the birds are

---

<sup>\*\*</sup> Some gas systems are designed in such a way that birds must still be dumped from their transport crates prior to entering the gas-filled chamber on a conveyer belt. While still retaining many of the welfare advantages of CAK systems, those that move birds through the gaseous atmosphere while they are still in their transport crates are considered optimal.

actually killed, rather than stunned, by the gas or gases.<sup>125</sup> In this way, the use of CAK fully obtains the welfare benefits of the method, as compared to CAS, in which the potential exists for birds to awaken from their unconscious state. Some commercial processors have continued to use the term “Controlled Atmosphere Stunning” even when they have a CAK system in place for various reasons. For example, birds subjected to CAK show residual heart activity for a few minutes after the cessation of other functions such as breathing.

### **Current Research on the Least Aversive Gas Mixtures**

Some of the first research on the use of gas to stun birds was published in the 1950s,<sup>126</sup> and, by the late 1990s, continuing research led to the adoption of the first commercial gas stunning systems.<sup>127</sup> CO<sub>2</sub>, a byproduct of the chemical and fertilizer industries, was initially examined in research studies for poultry slaughter plants, because it is easily obtainable and relatively inexpensive. However, interest in the inert gases, including argon and nitrogen, was sparked by human aviation physiology studies, which demonstrated that anoxia-induced unconsciousness is euphoric. It was on the basis of this research that studies into the least aversive gas mixtures began.

Inhalation of the inert gases is thought to be painless, as birds do not demonstrate aversive reactions with initial exposure. In carefully controlled behavior experiments, turkeys and chickens were willing to enter a chamber filled with argon in order to access food.<sup>128,129</sup> In contrast, there are both physiological and behavioral lines of scientific evidence suggesting that CO<sub>2</sub> may be unpleasant and possibly very distressing to inhale, as it is an acidic gas, pungent to inhale at high concentrations.<sup>130,131</sup> Birds have intrapulmonary chemoreceptors that detect CO<sub>2</sub>, but are insensitive to hypoxia induced with argon and nitrogen, which are tasteless and odorless. Indeed, they show signs of respiratory distress when exposed to CO<sub>2</sub><sup>132</sup> and will often avoid an atmosphere containing high concentrations of carbon dioxide when tested in behavior experiments.<sup>133,134</sup>

Some scientists, however, contend that there are also problems with the use of inert gases to stun birds. The primary concern is that inert gases cause convulsions as the birds lose consciousness. Convulsions are thought to be reflexive reactions occurring only after the bird has lost consciousness; however, some have questioned this tenet, as discussed below, and argue the thrashing of one bird may frighten or physically harm, albeit briefly, other birds in the vicinity who have not yet lost consciousness. These convulsions can be aesthetically unpleasant to human observers and also involve leg and wing movements powerful enough to throw the bird against the walls of the chamber and against other birds.<sup>135</sup> Further, broken wing bones caused by convulsions reduce the quality of the carcass. For these reasons and because inert gases are not readily available in large quantities or are more expensive to obtain than CO<sub>2</sub>, the poultry industry has been reluctant to broadly adopt this gas technology in the United States. In contrast, in the U.K., where the use of inert gases for stunning/killing birds has been approved, it is estimated that more than 75% of turkeys and 25% of broiler chickens slaughtered for human consumption are killed using inert mixtures.<sup>136</sup>

As a possible solution, two-step systems that first render the birds unconscious with a low level of CO<sub>2</sub> followed by a second stage with lethal CO<sub>2</sub> levels are being adopted commercially. Exposure to low concentrations of CO<sub>2</sub> (e.g., 30% by volume in air) does not cause convulsions to the extent that inert gases do and, despite its aversiveness, is thought to have an anaesthetic effect for a variety of species at low levels, reducing pain sensitivity.<sup>137</sup> The humaneness of exposure to low concentrations of CO<sub>2</sub> has been evaluated, and it has been argued that CO<sub>2</sub> levels of 30% or less may not be very much more aversive to inhale than the inert gas argon. This was demonstrated by scientists Bruce Webster and Daniel Fletcher at the University of Georgia in Athens in an experiment requiring hungry hens to enter a gas-filled chamber to access food. Nearly as many hens entered the feeding chamber and lost posture (an early sign of onset of unconsciousness) due to gas exposure when the chamber was filled with 30% CO<sub>2</sub> in air as compared to argon. Based on their analysis of hen behavior during their experiment and other published data, the researchers concluded that any bird welfare advantage of argon is relatively minor.<sup>138</sup> Similar results were found in another study that tested the aversiveness of various gas mixtures by exposing broiler chickens to a 10-second pulse of gas while the birds fed. Dorothy McKeegan, Faculty of Veterinary Medicine at the University of Glasgow, and her colleagues also found, based on the

tendency of chickens to cease feeding during gas delivery over the feed dish, that a low level of CO<sub>2</sub> is only mildly or moderately aversive.<sup>139</sup>

In a series of experiments published in 2007, McKeegan and her colleagues tested several gas mixtures and concluded that a two-step system—using 40% CO<sub>2</sub>, 30% O<sub>2</sub>, and 30% N in the first phase and 80% CO<sub>2</sub>, 5% O<sub>2</sub>, and 15% N in the second phase—was best from both an animal welfare and a meat quality perspective.<sup>140,141</sup> Not unexpectedly, behavioral observations at the processor showed that wing-flapping and jumping associated with convulsions were greater in the gas mixture tested that contained argon, and this led to fractured wings and hemorrhages that are considered unacceptable carcass quality problems by some processors. They concluded that the transition to a motionless state was longer but smoother using the 40% CO<sub>2</sub>, 30% O<sub>2</sub>, and 30% N in the induction phase.<sup>142</sup> A further concern was that a parallel laboratory study was not able to rule out the possibility that the initial vigorous behavioral response to the gas mixture containing argon occurred while chickens were still conscious.<sup>143</sup>

In spite of these concerns, research presented in 2006 and 2008 further evaluated gas aversion from the perspective of the birds themselves. Three different gas mixtures were presented to chickens at a feeding station fitted with gas outlets. The researchers at the Scottish Agricultural College found that the birds, given free choice, preferred to feed in the presence of inert gases, nitrogen and argon, with low CO<sub>2</sub> contents (less than 30% by volume).<sup>144,145</sup> The new studies reinforce the evidence that birds find inert gases less aversive than CO<sub>2</sub> at high concentrations.

Although the precise gas mixture is important, ongoing research should not prevent the poultry industry from adopting CAK technology. Regardless of the gas mixture used, CAK eliminates the problems associated with handling and shackling live birds, painful pre-stun shocks, and variations in current that may or may not adequately render birds insensible. Pending further research that will undoubtedly continue to refine and improve knowledge and understanding of the procedure, many gas mixtures currently provide higher welfare, including argon and nitrogen with less than 2% residual oxygen, and any mixture of argon, nitrogen, or other inert gases with up to 30% CO<sub>2</sub>.<sup>146</sup>

### **Additional Benefits of CAK**

In addition to the benefits associated with improved bird welfare, CAK also improves the working conditions for hanging operators. The job of shackling live birds is difficult, as the animals may resist and struggle; dirty, due to aerial dust, feather dander, excrement, and unsanitary working conditions; and environmentally challenging, as live-hang must be performed in low light to quiet the birds. By contrast, when CAK is used, hanging operators do not handle the birds until they are unconscious or killed, thereby eliminating these problems.<sup>††147</sup>

CAK also virtually eliminates carcass quality problems that can occur with electrical water-bath stunning. Poultry processors that have adopted gas technology have claimed that they have better product quality with fewer broken bones, blood spots, and bruising, and better bleed-out.<sup>148,149</sup>

### **Conclusion**

After a comprehensive review of the scientific literature, the Scientific Panel on Animal Health and Welfare, an official advisory body to the European Commission, stated:

---

<sup>††</sup> For additional information, see: An HSUS Report: Human Health Implications of Live Hang of Chickens and Turkeys on Slaughterhouse Workers at [www.hsus.org/web-files/PDF/farm/HSUS-Human-Health-Report-on-Poultry-Slaughter-Live-Hang-Workers.pdf](http://www.hsus.org/web-files/PDF/farm/HSUS-Human-Health-Report-on-Poultry-Slaughter-Live-Hang-Workers.pdf).

Since welfare is poor when the shackling line and water bath electrical stunning method is used, and birds are occasionally not stunned before slaughter, the method should be replaced as soon as possible. At present, the inert gas stun/killing method is the best alternative.<sup>150</sup>

The existing U.S. standard for electrical stunning of birds killed for human consumption does not conform to the guidelines of the World Organisation for Animal Health (OIE), which recommends as optimum a minimum of 100 mA delivered using 50 Hz sine wave alternating current per chicken.<sup>151</sup>

It is ethically imperative that slaughter be both quick and painless, particularly in countries such as the United States, wherein birds killed for food are not afforded legal protections to govern their welfare at slaughter. Given the current state of pre-slaughter stunning technology, CAK is the method that provides conditions for slaughtering birds with a minimum of avoidable pain and suffering. Further benefits, including better working conditions for hanging operators, avoiding food safety risks, and improved carcass quality, solidify that this technology is strongly preferred to the existing multiple-bird electrical water-bath stunning systems supplied with constant voltages. The OIE has commented positively on novel and higher welfare gaseous stunning and killing methods,<sup>152</sup> and it is imperative that the U.S. industry implement these technologies to improve animal welfare.

---

<sup>1</sup> U.S. Department of Agriculture National Agricultural Statistics Service. 2008. Poultry slaughter: 2007 annual summary. <http://usda.mannlib.cornell.edu/usda/current/PoulSlauSu/PoulSlauSu-02-28-2008.pdf>. Accessed September 5, 2008.

<sup>2</sup> Craig EW and Fletcher DL. 1997. A comparison of high current and low voltage electrical stunning systems on broiler breast rigor development and meat quality. *Poultry Science* 76(8):1178-81.

<sup>3</sup> Bilgili SF. 1992. Electrical stunning of broilers—basic concepts and carcass quality implications: a review. *Journal of Applied Poultry Research* 1(1):135-46.

<sup>4</sup> U.S. Department of Agriculture National Agricultural Statistics Service. 2008. Livestock slaughter: 2007 summary. [http://usda.mannlib.cornell.edu/usda/current/LiveSlauSu/LiveSlauSu-03-07-2008\\_revision.pdf](http://usda.mannlib.cornell.edu/usda/current/LiveSlauSu/LiveSlauSu-03-07-2008_revision.pdf). Accessed September 5, 2008.

<sup>5</sup> U.S. Department of Agriculture National Agricultural Statistics Service. 2008. Poultry slaughter: 2007 annual summary. <http://usda.mannlib.cornell.edu/usda/current/PoulSlauSu/PoulSlauSu-02-28-2008.pdf>. Accessed September 5, 2008.

<sup>6</sup> U.S. Department of Agriculture Food Safety and Inspection Service. 2005. Treatment of live poultry before slaughter; notice. September 28. *Federal Register* 70(187):56624-26.

<sup>7</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.

<sup>8</sup> Raj M. 1998. Welfare during stunning and slaughter of poultry. *Poultry Science* 77(12):1815-9.

<sup>9</sup> Shane SM. 2005. Future of gas stunning. *WATT Poultry USA* 6(4):16-23.

<sup>10</sup> Shane SM. 2005. Future of gas stunning. *WATT Poultry USA* 6(4):16-23.

<sup>11</sup> Sparrey JM and Kettlewell PJ. 1994. Shackling of poultry: is it a welfare problem? *World's Poultry Science Journal* 50:167-76.

<sup>12</sup> Gregory NG and Bell JC. 1987. Duration of wing flapping in chickens shackled before slaughter. *The Veterinary Record* 121(24):567-9.

<sup>13</sup> Parker LH, Bajoie KC, Castille S, Cadd GG, Satterlee DG, and Jones RB. 1997. Sex and shank diameter affect struggling behaviour of shackled broilers. *Poultry Science* 76(Supplement 1):88.

<sup>14</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).

<sup>15</sup> Gentle MJ and Tilston VL. 2000. Nociceptors in the legs of poultry: implications for potential pain in pre-slaughter shackling. *Animal Welfare* 9(3):227-36.

<sup>16</sup> Gentle MJ. 1992. Ankle joint (art. intertarsalis) receptors in the domestic fowl. *Neuroscience* 49(4):991-1000.

<sup>17</sup> European Food Safety Authority. 2004. Scientific report of the Scientific Panel for Animal Health and Welfare on a request from the Commission related to welfare aspects of animal stunning and killing methods, pp. 125-6.

---

[www.efsa.europa.eu/cs/BlobServer/Scientific Opinion/opinion\\_ahaw\\_02\\_ej45\\_stunning\\_report\\_v2\\_en1.1.pdf](http://www.efsa.europa.eu/cs/BlobServer/Scientific%20Opinion/opinion_ahaw_02_ej45_stunning_report_v2_en1.1.pdf). Accessed September 5, 2008.

- <sup>18</sup> Danbury TC, Weeks CA, Chambers JP, Waterman-Pearson AE, and Kestin SC. 2000. Self-selection of the analgesic drug carprofen by lame broiler chickens. *The Veterinary Record* 146(11):307-11.
- <sup>19</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>20</sup> Kannan G and Mench JA. 1996. Influence of different handling methods and crating periods on plasma corticosterone concentrations in broilers. *British Poultry Science* 37(1):21-31.
- <sup>21</sup> Debut M, Berri C, Arnould C, et al. 2005. Behavioural and physiological responses of three chicken breeds to pre-slaughter shackling and acute heat stress. *British Poultry Science* 46(5):527-35.
- <sup>22</sup> Kannan G, Heath JL, Wabeck CJ, and Mench JA. 1997. Shackling of broilers: effects on stress responses and breast meat quality. *British Poultry Science* 38(4):323-32.
- <sup>23</sup> Bedanova I, Voslarova E, Chloupek P, et al. 2007. Stress in broilers resulting from shackling. *Poultry Science* 86(6):1065-9.
- <sup>24</sup> Kannan G, Heath JL, Wabeck CJ, and Mench JA. 1997. Shackling of broilers: effects on stress responses and breast meat quality. *British Poultry Science* 38(4):323-32.
- <sup>25</sup> European Food Safety Authority. 2004. Opinion of the Scientific Panel on Animal Health and Welfare (AHAW) on a request from the Commission related to welfare aspects of the main systems of stunning and killing the main commercial species of animals. [www.efsa.europa.eu/EFSA/efsa\\_locale-1178620753812\\_1178620775454.htm](http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178620775454.htm). Accessed September 5, 2008.
- <sup>26</sup> Gregory NG and Bell JC. 1987. Duration of wing flapping in chickens shackled before slaughter. *The Veterinary Record* 121(24):567-9.
- <sup>27</sup> European Food Safety Authority. 2004. Opinion of the Scientific Panel on Animal Health and Welfare (AHAW) on a request from the Commission related to welfare aspects of the main systems of stunning and killing the main commercial species of animals. [www.efsa.europa.eu/EFSA/efsa\\_locale-1178620753812\\_1178620775454.htm](http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178620775454.htm). Accessed September 5, 2008.
- <sup>28</sup> Sparrey JM, Kettlewell PJ, Paice MER, and Whetlor WC. 1993. Development of a constant current water bath stunner for poultry processing. *Journal of Agricultural Engineering Research* 56(4):267-74.
- <sup>29</sup> Schütt-Abraham I, Wormuth HJ, and Fessel J. 1983. Electrical stunning of poultry in view of animal welfare and meat production. In: Eikelenboom G (ed.), *Stunning of Animals for Slaughter* (The Hague, Netherlands: Martinus Nijhoff Publishers, pp. 187-96).
- <sup>30</sup> Gazdziak S. 2007. Kill floor improvements: automation on the poultry kill and eviscerating lines is increasing efficiency and product quality. *The National Provisioner*, December, pp. 66, 68.
- <sup>31</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>32</sup> Gregory NG. 1994. Pathology and handling of poultry at the slaughterhouse. *World's Poultry Science Journal* 50:66-7.
- <sup>33</sup> Raj M. 1998. Welfare during stunning and slaughter of poultry. *Poultry Science* 77(12):1815-9.
- <sup>34</sup> Wooton [sic] SB and Gregory NG. 1991. How to prevent pre-stun electric shocks in waterbath stunners. *Turkeys* 39(2):15, 30.
- <sup>35</sup> Wooton [sic] SB and Gregory NG. 1991. How to prevent pre-stun electric shocks in waterbath stunners. *Turkeys* 39(2):15, 30.
- <sup>36</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.
- <sup>37</sup> Wooton [sic] SB and Gregory NG. 1991. How to prevent pre-stun electric shocks in waterbath stunners. *Turkeys* 39(2):15, 30.
- <sup>38</sup> Raj ABM, O'Callaghan M, and Hughes SI. 2006. The effects of amount and frequency of pulsed direct current used in water bath stunning and of slaughter methods on spontaneous electroencephalograms in broilers. *Animal Welfare* 15(1):19-24.
- <sup>39</sup> Raj ABM, O'Callaghan M, and Knowles TG. 2006. The effects of amount and frequency of alternating current used in water bath stunning and of slaughter methods on electroencephalograms in broilers. *Animal Welfare* 15(1):7-18.

- 
- <sup>40</sup> Boyd F. 1994. Humane slaughter of poultry: the case against the use of electrical stunning devices. *Journal of Agricultural & Environmental Ethics* 7(2):221-36.
- <sup>41</sup> Gregory NG and Wotton SB. 1987. Effect of electrical stunning on the electroencephalogram in chickens. *British Veterinary Journal* 143(2):175-83.
- <sup>42</sup> Raj ABM. 2003. A critical appraisal of electrical stunning in chickens. *World's Poultry Science Journal* 59(1):89-98.
- <sup>43</sup> Gregory NG and Wotton SB. 1987. Effect of electrical stunning on the electroencephalogram in chickens. *British Veterinary Journal* 143(2):175-83.
- <sup>44</sup> Gregory NG. 1986. The physiology of electrical stunning and slaughter. In: *Humane Slaughter of Animals for Food Symposium* (Hertfordshire, U.K.: Universities Federation for Animal Welfare, pp. 3-14).
- <sup>45</sup> Boyd F. 1994. Humane slaughter of poultry: the case against the use of electrical stunning devices. *Journal of Agricultural & Environmental Ethics* 7(2):221-36.
- <sup>46</sup> Raj ABM. 2003. A critical appraisal of electrical stunning in chickens. *World's Poultry Science Journal* 59(1):89-98.
- <sup>47</sup> Raj ABM, O'Callaghan M, and Knowles TG. 2006. The effects of amount and frequency of alternating current used in water bath stunning and of slaughter methods on electroencephalograms in broilers. *Animal Welfare* 15(1):7-18.
- <sup>48</sup> Raj ABM, O'Callaghan M, and Knowles TG. 2006. The effects of amount and frequency of alternating current used in water bath stunning and of slaughter methods on electroencephalograms in broilers. *Animal Welfare* 15(1):7-18.
- <sup>49</sup> Raj ABM. 2006. Recent developments in stunning and slaughter of poultry. *World's Poultry Science Journal* 62(3):467-84.
- <sup>50</sup> Craig EW and Fletcher DL. 1997. A comparison of high current and low voltage electrical stunning systems on broiler breast rigor development and meat quality. *Poultry Science* 76(8):1178-81.
- <sup>51</sup> Wilkins LJ, Wotton SB, Parkman ID, Kettlewell PJ, and Griffiths P. 1999. Constant current stunning effects on bird welfare and carcass quality. *Journal of Applied Poultry Research* 8(4):465-71.
- <sup>52</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>53</sup> Raj ABM, O'Callaghan M, and Hughes SI. 2006. The effects of pulse width of a direct current used in water bath stunning and of slaughter methods on spontaneous electroencephalograms in broilers. *Animal Welfare* 15(1):25-30.
- <sup>54</sup> Wilkins LJ, Wotton SB, Parkman ID, Kettlewell PJ, and Griffiths P. 1999. Constant current stunning effects on bird welfare and carcass quality. *Journal of Applied Poultry Research* 8(4):465-71.
- <sup>55</sup> Sams AR. 2001. First processing: slaughter through chilling. In: Sams AR (ed.), *Poultry Meat Processing* (Washington, DC: CRC Press, p. 21).
- <sup>56</sup> Nunes F. 2007. How to avoid bruising during electrical poultry stunning. *Meatingplace.com*, May.
- <sup>57</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.
- <sup>58</sup> Gazdziak S. 2007. Kill floor improvements: automation on the poultry kill and eviscerating lines is increasing efficiency and product quality. *The National Provisioner*, December, pp. 66, 68.
- <sup>59</sup> Raj ABM, O'Callaghan M, and Hughes SI. 2006. The effects of amount and frequency of pulsed direct current used in water bath stunning and of slaughter methods on spontaneous electroencephalograms in broilers. *Animal Welfare* 15(1):19-24.
- <sup>60</sup> Raj ABM, O'Callaghan M, and Knowles TG. 2006. The effects of amount and frequency of alternating current used in water bath stunning and of slaughter methods on electroencephalograms in broilers. *Animal Welfare* 15(1):7-18.
- <sup>61</sup> Raj ABM, O'Callaghan M, and Hughes SI. 2006. The effects of amount and frequency of pulsed direct current used in water bath stunning and of slaughter methods on spontaneous electroencephalograms in broilers. *Animal Welfare* 15(1):19-24.
- <sup>62</sup> Raj ABM, O'Callaghan M, and Hughes SI. 2006. The effects of pulse width of a direct current used in water bath stunning and of slaughter methods on spontaneous electroencephalograms in broilers. *Animal Welfare* 15(1):25-30.

- 
- <sup>63</sup> Wilkins LJ, Wotton SB, Parkman ID, Kettlewell PJ, and Griffiths P. 1999. Constant current stunning effects on bird welfare and carcass quality. *Journal of Applied Poultry Research* 8(4):465-71.
- <sup>64</sup> Raj ABM. 2003. A critical appraisal of electrical stunning in chickens. *World's Poultry Science Journal* 59(1):89-98.
- <sup>65</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.
- <sup>66</sup> Gazdziak S. 2007. Kill floor improvements: automation on the poultry kill and eviscerating lines is increasing efficiency and product quality. *The National Provisioner*, December, pp. 66, 68.
- <sup>67</sup> Raj ABM, O'Callaghan M, and Hughes SI. 2006. The effects of amount and frequency of pulsed direct current used in water bath stunning and of slaughter methods on spontaneous electroencephalograms in broilers. *Animal Welfare* 15(1):19-24.
- <sup>68</sup> Raj ABM, O'Callaghan M, and Hughes SI. 2006. The effects of pulse width of a direct current used in water bath stunning and of slaughter methods on spontaneous electroencephalograms in broilers. *Animal Welfare* 15(1):25-30.
- <sup>69</sup> Raj ABM. 2003. A critical appraisal of electrical stunning in chickens. *World's Poultry Science Journal* 59(1):89-98.
- <sup>70</sup> Raj ABM, O'Callaghan M, and Knowles TG. 2006. The effects of amount and frequency of alternating current used in water bath stunning and of slaughter methods on electroencephalograms in broilers. *Animal Welfare* 15(1):7-18.
- <sup>71</sup> Schütt-Abraham I, Wormuth HJ, and Fessel J. 1983. Electrical stunning of poultry in view of animal welfare and meat production. In: Eikelenboom G (ed.), *Stunning of Animals for Slaughter* (The Hague, Netherlands: Martinus Nijhoff Publishers, pp. 187-96).
- <sup>72</sup> Wilkins LJ, Wotton SB, Parkman ID, Kettlewell PJ, and Griffiths P. 1999. Constant current stunning effects on bird welfare and carcass quality. *Journal of Applied Poultry Research* 8(4):465-71.
- <sup>73</sup> Sparrey JM, Kettlewell PJ, Paice MER, and Whetlor WC. 1993. Development of a constant current water bath stunner for poultry processing. *Journal of Agricultural Engineering Research* 56(4):267-74.
- <sup>74</sup> Kettlewell PJ and Hallworth RN. 1990. Electrical stunning of chickens. *Journal of Agricultural Engineering Research* 47(3):139-51.
- <sup>75</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.
- <sup>76</sup> Raj M and Tserveni-Gousi A. 2000. Stunning methods for poultry. *World's Poultry Science Journal* 56(4):291-304.
- <sup>77</sup> Boyd F. 1994. Humane slaughter of poultry: the case against the use of electrical stunning devices. *Journal of Agricultural & Environmental Ethics* 7(2):221-36.
- <sup>78</sup> Bilgili SF. 1992. Electrical stunning of broilers—basic concepts and carcass quality implications: a review. *Journal of Applied Poultry Research* 1(1):135-46.
- <sup>79</sup> Kettlewell PJ and Hallworth RN. 1990. Electrical stunning of chickens. *Journal of Agricultural Engineering Research* 47(3):139-51.
- <sup>80</sup> Wilkins LJ, Wotton SB, Parkman ID, Kettlewell PJ, and Griffiths P. 1999. Constant current stunning effects on bird welfare and carcass quality. *Journal of Applied Poultry Research* 8(4):465-71.
- <sup>81</sup> Boyd F. 1994. Humane slaughter of poultry: the case against the use of electrical stunning devices. *Journal of Agricultural & Environmental Ethics* 7(2):221-36.
- <sup>82</sup> Bilgili SF. 1992. Electrical stunning of broilers—basic concepts and carcass quality implications: a review. *Journal of Applied Poultry Research* 1(1):135-46.
- <sup>83</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>84</sup> Boyd F. 1994. Humane slaughter of poultry: the case against the use of electrical stunning devices. *Journal of Agricultural & Environmental Ethics* 7(2):221-36.
- <sup>85</sup> Schütt-Abraham I, Wormuth HJ, and Fessel J. 1983. Electrical stunning of poultry in view of animal welfare and meat production. In: Eikelenboom G (ed.), *Stunning of Animals for Slaughter* (The Hague, Netherlands: Martinus Nijhoff Publishers, pp. 187-96).
- <sup>86</sup> Sparrey JM, Kettlewell PJ, Paice MER, and Whetlor WC. 1993. Development of a constant current water bath stunner for poultry processing. *Journal of Agricultural Engineering Research* 56(4):267-74.

- 
- <sup>87</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), Poultry Meat Processing and Quality (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>88</sup> Raj ABM. 2004. Stunning and slaughter. In: Perry GC (ed.), Welfare of the Laying Hen (Wallingford, U.K.: CAB International).
- <sup>89</sup> Wilkins LJ, Wotton SB, Parkman ID, Kettlewell PJ, and Griffiths P. 1999. Constant current stunning effects on bird welfare and carcass quality. *Journal of Applied Poultry Research* 8(4):465-71.
- <sup>90</sup> Sparrey JM, Kettlewell PJ, Paice MER, and Whetlor WC. 1993. Development of a constant current water bath stunner for poultry processing. *Journal of Agricultural Engineering Research* 56(4):267-74.
- <sup>91</sup> Sparrey JM, Kettlewell PJ, Paice MER, and Whetlor WC. 1993. Development of a constant current water bath stunner for poultry processing. *Journal of Agricultural Engineering Research* 56(4):267-74.
- <sup>92</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), Poultry Meat Processing and Quality (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>93</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.
- <sup>94</sup> Gazdziak S. 2007. Kill floor improvements: automation on the poultry kill and eviscerating lines is increasing efficiency and product quality. *The National Provisioner*, December, pp. 66, 68.
- <sup>95</sup> Raj M and Tserveni-Gousi A. 2000. Stunning methods for poultry. *World's Poultry Science Journal* 56(4):291-304.
- <sup>96</sup> Heath GBS, Watt DJ, Waite PR, and Ormond JM. 1981. Observations on poultry slaughter. *The Veterinary Record* 108(5):97-9.
- <sup>97</sup> Raj ABM. 2004. Stunning and slaughter. In: Perry GC (ed.), Welfare of the Laying Hen (Wallingford, U.K.: CAB International).
- <sup>98</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.
- <sup>99</sup> Schütt-Abraham I, Wormuth HJ, and Fessel J. 1983. Electrical stunning of poultry in view of animal welfare and meat production. In: Eikelenboom G (ed.), *Stunning of Animals for Slaughter* (The Hague, Netherlands: Martinus Nijhoff Publishers, pp. 187-96).
- <sup>100</sup> Raj ABM. 2004. Stunning and slaughter. In: Perry GC (ed.), Welfare of the Laying Hen (Wallingford, U.K.: CAB International).
- <sup>101</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.
- <sup>102</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), Poultry Meat Processing and Quality (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>103</sup> Heath GBS, Watt DJ, Waite PR, and Ormond JM. 1981. Observations on poultry slaughter. *The Veterinary Record* 108(5):97-9.
- <sup>104</sup> Shane S. 2005. Future of gas stunning. *WATT Poultry USA* 6(4):16-23.
- <sup>105</sup> Van der Sluis W. 2007. Gas stunning reduces rejects in spent hen processing. *World Poultry* 23(9):30-1.
- <sup>106</sup> Webster AB. 2007. The commercial egg industry should consider controlled atmosphere stunning for spent hens. *The Poultry Site*, July. [www.thepoultrysite.com/articles/864/the-commercial-egg-industry-should-consider-controlled-atmosphere-stunning-for-spent-hens](http://www.thepoultrysite.com/articles/864/the-commercial-egg-industry-should-consider-controlled-atmosphere-stunning-for-spent-hens). Accessed September 5, 2008.
- <sup>107</sup> National Institute for Animal Agriculture. 2007. U.S. broiler health shows slight decline. *Poultry Health Report*, Fall/Winter, p. 2. [www.animalagriculture.org/publications/poultry/2007PHR/Poultry\\_Fall-Winter\\_2007.pdf](http://www.animalagriculture.org/publications/poultry/2007PHR/Poultry_Fall-Winter_2007.pdf). Accessed September 5, 2008.
- <sup>108</sup> Bilgili SF. 1999. Recent advances in electrical stunning. *Poultry Science* 78(2):282-6.
- <sup>109</sup> Gregory NG. 1986. The physiology of electrical stunning and slaughter. In: *Humane Slaughter of Animals for Food Symposium* (Hertfordshire, U.K.: Universities Federation for Animal Welfare, pp. 3-14).
- <sup>110</sup> Raj ABM. 2003. A critical appraisal of electrical stunning in chickens. *World's Poultry Science Journal* 59(1):89-98.
- <sup>111</sup> Raj ABM, O'Callaghan M, and Knowles TG. 2006. The effects of amount and frequency of alternating current used in water bath stunning and of slaughter methods on electroencephalograms in broilers. *Animal Welfare* 15(1):7-18.
- <sup>112</sup> Gregory NG and Wotton SB. 1986. Effect of slaughter on the spontaneous and evoked activity of the brain. *British Poultry Science* 27:195-205.

- 
- <sup>113</sup> Raj ABM, O'Callaghan M, and Hughes SI. 2006. The effects of amount and frequency of pulsed direct current used in water bath stunning and of slaughter methods on spontaneous electroencephalograms in broilers. *Animal Welfare* 15(1):19-24.
- <sup>114</sup> Raj ABM. 2004. Stunning and slaughter. In: Perry GC (ed.), *Welfare of the Laying Hen* (Wallingford, U.K.: CAB International).
- <sup>115</sup> Gregory NG. 1986. The physiology of electrical stunning and slaughter. In: *Humane Slaughter of Animals for Food Symposium* (Hertfordshire, U.K.: Universities Federation for Animal Welfare, pp. 3-14).
- <sup>116</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>117</sup> Heath GBS, Watt DJ, Waite PR, and Ormond JM. 1981. Observations on poultry slaughter. *The Veterinary Record* 108(5):97-9.
- <sup>118</sup> Heath GBS, Watt DJ, Waite PR, and Meakins PA. 1983. Further observations on the slaughter of poultry. *British Veterinary Journal* 139(4):285-90.
- <sup>119</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>120</sup> Shane S. 2005. Future of gas stunning. *WATT Poultry USA* 6(4):16-23.
- <sup>121</sup> Food Safety and Inspection Service. 2005. Poultry Slaughter Inspection Training. Poultry postmortem inspection, p. 15. [www.fsis.usda.gov/PDF/PSIT\\_PostMortem.pdf](http://www.fsis.usda.gov/PDF/PSIT_PostMortem.pdf). Accessed September 5, 2008.
- <sup>122</sup> U.S. Department of Agriculture National Agricultural Statistics Service. 2008. Poultry slaughter: 2007 annual summary. <http://usda.mannlib.cornell.edu/usda/current/PoulSlauSu/PoulSlauSu-02-28-2008.pdf>. Accessed September 5, 2008.
- <sup>123</sup> Boyd F. 1994. Humane slaughter of poultry: the case against the use of electrical stunning devices. *Journal of Agricultural & Environmental Ethics* 7(2):221-36.
- <sup>124</sup> Raj M. 1998. Welfare during stunning and slaughter of poultry. *Poultry Science* 77(12):1815-9.
- <sup>125</sup> Raj M. 1998. Welfare during stunning and slaughter of poultry. *Poultry Science* 77(12):1815-9.
- <sup>126</sup> Kotula AW, Drewniak EE, and Davis LL. 1957. Effect of carbon dioxide immobilization on the bleeding of chickens. *Poultry Science* 36(3):585-9.
- <sup>127</sup> Duncan IJH. 1997. Killing methods for poultry: a report on the use of gas in the U.K. to render birds unconscious prior to slaughter (Guelph, Ontario: The Colonel K.L. Campbell Centre for the Study of Animal Welfare, University of Guelph).
- <sup>128</sup> Webster AB and Fletcher DL. 2004. Assessment of the aversion of hens to different gas atmospheres using an approach-avoidance test. *Applied Animal Behaviour Science* 88(3-4):275-87.
- <sup>129</sup> Raj ABM. 1996. Aversive reactions of turkeys to argon, carbon dioxide and a mixture of carbon dioxide and argon. *The Veterinary Record* 138(24):592-3.
- <sup>130</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>131</sup> Raj M. 1998. Welfare during stunning and slaughter of poultry. *Poultry Science* 77(12):1815-9.
- <sup>132</sup> Raj ABM. 2004. Stunning and slaughter. In: Perry GC (ed.), *Welfare of the Laying Hen* (Wallingford, U.K.: CAB International).
- <sup>133</sup> Raj M. 1998. Welfare during stunning and slaughter of poultry. *Poultry Science* 77(12):1815-9.
- <sup>134</sup> Raj ABM. 1996. Aversive reactions of turkeys to argon, carbon dioxide and a mixture of carbon dioxide and argon. *The Veterinary Record* 138(24):592-3.
- <sup>135</sup> Webster AB and Fletcher DL. 2004. Assessment of the aversion of hens to different gas atmospheres using an approach-avoidance test. *Applied Animal Behaviour Science* 88(3-4):275-87.
- <sup>136</sup> Personal correspondence between co-author Mohan Raj and Anglia Autoflow Ltd.
- <sup>137</sup> Andrews E, Bennett BT, Clark JD, et al. 1993. Report of the AVMA Panel on Euthanasia. *Journal of the American Veterinary Medical Association* 202(2):229-49. [www.nal.usda.gov/awic/pubs/noawicpubs/avmaeuth93.htm](http://www.nal.usda.gov/awic/pubs/noawicpubs/avmaeuth93.htm). Accessed September 5, 2008.
- <sup>138</sup> Webster AB and Fletcher DL. 2004. Assessment of the aversion of hens to different gas atmospheres using an approach-avoidance test. *Applied Animal Behaviour Science* 88(3-4):275-87.

- 
- <sup>139</sup> McKeegan DEF, McIntyre J, Demmers TGM, Wathes CM, and Jones RB. 2006. Behavioural responses of broiler chickens during acute exposure to gaseous stimulation. *Applied Animal Behaviour Science* 99(3-4):271-86.
- <sup>140</sup> McKeegan DEF, Abeyesinghe SM, McLeman MA, et al. 2007. Controlled atmosphere stunning of broiler chickens. II. Effects on behaviour, physiology and meat quality in a commercial processing plant. *British Poultry Science* 48(4):430-42.
- <sup>141</sup> Abeyesinghe SM, McKeegan DEF, McLeman MA, et al. 2007. Controlled atmosphere stunning of broiler chickens. I. Effects on behaviour, physiology and meat quality in a pilot scale system at a processing plant. *British Poultry Science* 48(4):406-23.
- <sup>142</sup> McKeegan DEF, Abeyesinghe SM, McLeman MA, et al. 2007. Controlled atmosphere stunning of broiler chickens. II. Effects on behaviour, physiology and meat quality in a commercial processing plant. *British Poultry Science* 48(4):430-42.
- <sup>143</sup> McKeegan DEF, McIntyre JA, Demmers TGM, et al. 2007. Physiological and behavioural responses of broilers to controlled atmosphere stunning: implications for welfare. *Animal Welfare* 16(4):409-26.
- <sup>144</sup> Sandilands V, Raj ABM, Baker L, and Sparks NHC. 2006. Aversion of chickens to various gases: methods for humane culling. In: Mendl M, Bradshaw JWS, Burman OHP, et al. (eds.), *Proceedings of the 40th International Congress of the International Society for Applied Ethology* (Bristol, U.K.: ISAE Scientific Committee, p. 64).
- <sup>145</sup> Sandilands V, Raj ABM, Baker L, and Sparks NHC. 2008. Humane culling of poultry during a disease outbreak: aversion to various gas mixtures. *British Poultry Abstracts* 4(1):22-3.
- <sup>146</sup> Raj ABM. 2004. Stunning and slaughter of poultry. In: Mead GC (ed.), *Poultry Meat Processing and Quality* (Cambridge, U.K.: Woodhead Publishing Ltd.).
- <sup>147</sup> Gazdziak S. 2007. Kill floor improvements: automation on the poultry kill and eviscerating lines is increasing efficiency and product quality. *The National Provisioner*, December, pp. 66, 68.
- <sup>148</sup> MBA Poultry. 2006. Smart Chicken. Pioneering controlled atmosphere stunning in the United States. [www.smartchicken.com/fac.html](http://www.smartchicken.com/fac.html). Accessed September 5, 2008.
- <sup>149</sup> Kingsbury A. 2007. Controlled atmospheric stunning: ACA Co-operative installs North America's first system for broilers. *Canadian Poultry Magazine*, August, pp. 28-30. [www.canadianpoultrymag.com/content/view/867/](http://www.canadianpoultrymag.com/content/view/867/). Accessed September 5, 2008.
- <sup>150</sup> European Food Safety Authority. 2004. Opinion of the Scientific Panel on Animal Health and Welfare on a request from the Commission related to welfare aspects of the main systems of stunning and killing the main commercial species of animals. *The EFSA Journal* 45:1-29.
- <sup>151</sup> World Organisation for Animal Health (OIE). 2008. Terrestrial Animal Health Code 2007. Section 3.7.5. Guidelines for the slaughter of animals. [www.oie.int/eng/normes/mcode/en\\_chapitre\\_3.7.5.htm](http://www.oie.int/eng/normes/mcode/en_chapitre_3.7.5.htm). Accessed September 5, 2008.
- <sup>152</sup> World Organisation for Animal Health (OIE). 2008. Terrestrial Animal Health Code 2007. Section 3.7.5. Guidelines for the slaughter of animals. [www.oie.int/eng/normes/mcode/en\\_chapitre\\_3.7.5.htm](http://www.oie.int/eng/normes/mcode/en_chapitre_3.7.5.htm). Accessed September 5, 2008.

The Humane Society of the United States is the nation's largest animal protection organization—backed by 10 million Americans, or one of every 30. For more than a half-century, The HSUS has been fighting for the protection of all animals through advocacy, education, and hands-on programs. Celebrating animals and confronting cruelty. On the Web at [humanesociety.org](http://humanesociety.org).