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3-D Jobs and Health Disparities: The Health Implications of Latino Chicken Catchers' Working Conditions

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Objectives *This study uses qualitative data to describe the tasks performed by chicken catchers, their organization of work, and possible health and safety hazards encountered.*

Methods *Twenty-one Latino immigrant chicken catchers for North Carolina poultry-processing plants were interviewed to obtain their perceptions of the job and its hazards. Interviews were recorded and transcribed (n = 10) or detailed notes recorded (n = 11). Transcripts and notes were subjected to qualitative analysis.*

Results *Chicken catching takes place in a highly contaminated and hazardous work environment. The fast pace of work, low level of control over work intensity, and piece rate compensation all result in high potential for work-related injury and illness, including trauma, electrical shock, respiratory effects, musculoskeletal injuries, and drug use. Workers receive little safety or job training.*

Conclusions *Chicken catching is characterized by a work environment and organization of work that promote injury and illness.* Am. J. Ind. Med. 56:206–215, 2013.

KEY WORDS: immigrant worker; social justice; organization of work; poultry processing

INTRODUCTION

The unequal representation of racial and ethnic minorities in dirty, dangerous, and demanding (3-D) jobs is a significant challenge to reducing occupational health disparities. Such jobs are often characterized by employment uncertainty, low wages, and poor or dangerous working conditions. Despite the publicity occasionally afforded these jobs by the news media or by reality television programs, many 3-D jobs are occupied by few enough or ''invisible'' enough workers that they remain largely hidden from public notice. Both the European Agency for Safety and Health at Work and the United Nations' International Labor Organization have issued parallel statements highlighting the overrepresentation of immigrant workers in 3-D jobs [International Labour Office, 2004; European Agency for Safety and Health at Work, 2007]. The disproportionate exposure of immigrants to 3-D jobs is, therefore, an important leverage point and target for reducing occupational health disparities.

Although 3-D jobs likely contribute to health disparities, there are few viable solutions to the problem.

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Eliminating 3-D jobs is not a feasible solution because many are necessary: communities need garbage collectors and waste treatment plants, and mechanical or automated procedures are not yet available for all tasks performed by 3-D workers. Reallocating non-minority workers is also not a viable solution. Although such a strategy may succeed in reducing occupational health disparities, it would do little to reduce the overall suffering and burden that accompany employment in 3-D jobs. More viable solutions may be the exploration of possible changes in the way these jobs are organized [Karasek & Theorell, 1990] so that management works to reduce health risks, and the creation of safety training interventions that enable workers to prevent negative health outcomes. Development of effective interventions and changes in work organization require systematic descriptions of the job, focusing on the health hazards confronted and the health effects experienced by 3-D workers.

This study focuses on one 3-D job: chicken catching in the US poultry processing industry. Chicken catchers gather and cage chickens in confined animal feeding operations (CAFOs) in order to transport the birds to processing plants for slaughter. These CAFOs are long, narrow metal barns with ventilation fans at ends or sidewalls. Barns house 10,000–125,000 birds [US EPA, 2002] that enter as chicks and typically leave as broilers, 7-week-old birds weighing 3–10 pounds. Chicken catchers make up a small proportion of the estimated 250,000 poultry processing workers in the modern US vertically integrated poultry industry. Historically, this industry has had a largely minority workforce. In recent years, this workforce has increasingly become composed of immigrant workers, about half of whom are from Latin America [Striffler, 2005]. Occupational injuries and illnesses in the industry are higher than for the manufacturing sector as a whole. The incidence of injuries in poultry in 2009 was 4.4/10,000 full time workers versus 3.9/10,000 in the whole manufacturing sector. Occupational illness rates (e.g., skin disorders, respiratory conditions) in 2009 were 100.7/10,000 workers versus 39.0/10,000 workers in the sector as a whole [Bureau of Labor Statistics, 2011]. However, there are no data on the occupational health risks, injuries, or illnesses of chicken catchers.

Two approaches to worker health guide this study. The first is a traditional examination of the workplace as a source of environmental exposures that lead to injury and illness. These include tools, equipment, chemicals, and other aspects of the setting in which work takes place. The second is a focus on the workplace as a source of stressors that can contribute to short- and long-term illnesses and injuries. Such stressors include repetitive work, piece-rate work, arbitrary supervision, and low-skilled work. The job strain model [Karasek & Theorell, 1990] proposes that the greatest health risk from such stressors occurs when workers face high psychological demands and have low levels of control in meeting those demands. That is, workers must work very fast and very hard, but have little opportunity to make decisions about when or how their work is performed.

This study presents a qualitative, exploratory study as a first step toward understanding the job of chicken catching and its health and safety risks. Qualitative methods facilitate exploratory research in a population when too little is known about it to construct a sampling frame or survey instrument [Arcury and Quandt, 1999]. The goals of this study are to use qualitative data to (1) describe the tasks performed by chicken catchers, (2) describe their organization of work, and (3) identify possible health and safety hazards encountered by chicken catchers.

MATERIALS AND METHODS

Design

This research is part of a larger environmental justice study of poultry processing workers conducted in the area surrounding the plants of three poultry processing companies in western North Carolina [Quandt et al., 2006; Grzywacz et al., 2009; Marín et al., 2009a,b]. The research has been carried out in a community-based participatory research framework as a partnership between Wake Forest School of Medicine (WFSM) and three community-based organizations that provide services to immigrant workers, many of whom work in the poultry industry. These community-based organizations are Centro Latino of Caldwell County, Western North Carolina Workers Center, and HOLA of Wilkes County, Inc.

The larger study conducted formative research (in-depth interviews) and survey interviews with poultry processing workers to develop and implement a lay health advisor (*promotora de salud*) led health and safety education program [Grzywacz et al., 2009]. In this program, the lay health advisors kept field notes of interactions with individual workers who received the education. Some catchers participated in these initial phases of the research. In 2009, a focused study of catchers was undertaken in which catchers were recruited from the same area for in-depth interviews.

Recruitment and Sample

For all of the qualitative interviews and the lay health advisor program, workers were recruited by word of mouth in the community. Interviewers, who were community residents, sought the names of possible participants through social networks and key informants such as *tienda* owners, church pastors, and other formal and informal community leaders. Attempts were made to recruit equally

from throughout the region surrounding the plants of the three poultry companies. In the first phases of the study, recruitment did not consider the type of poultry processing job; in the focused study, only catchers were recruited. For the focused study, nine catchers who were contacted could never be scheduled for an interview (n = 4), refused to be interviewed (n = 4), or withdrew consent during the interview (n = 1). All others who could be found were interviewed.

Data come from a total of 21 catchers; 11 were included in the lay health advisor program, and 10 were interviewed in the focused study of catchers. In all study phases, eligibility criteria were: age 18 years or older, self-described Latino, and currently working in poultry processing. To be included in the analyses presented here, workers had to report current work as a chicken catcher.

Data Collection

For the in-depth interviews, interview guides were constructed that focused on asking workers to describe their jobs and how the work was organized (e.g., hierarchy of workers, relations between supervisor and workers, hours, pay structure). Probes were used to elicit descriptions of their working conditions, any safety training received, safety equipment and personal protective equipment provided or used, their perceptions of the health consequences of their jobs, and self- and medical treatment of injuries. As interviews were conducted and reviewed, the study team added probes or additional topics to better explicate topics that arose in the interviews. Experienced in-depth interviewers who underwent additional study-specific training conducted all interviews. All interviewers were conducted in Spanish. The interviewers were native Spanish-speakers, and trusted residents of the study area. Interviews were recorded, transcribed, and translated to English by study staff who were familiar with poultry work, bilingual native Spanish speakers and familiar with variants of Spanish spoken locally. Prior to any data collection, participants were informed of the purpose of the research and that participation was voluntary. All procedures were approved by the Wake Forest School of Medicine Institutional Review Board (WFSM IRB). The WFSM IRB waived the necessity for signed informed consent because the risk of signing by potentially undocumented workers was considered a greater risk than the study procedures.

Additional data come from the field notes recorded by lay health advisors. These notes were recorded with no identifiers after educational sessions with individual workers. In these field notes, lay health advisors included the job the worker held in the poultry industry. Notes pertaining to chicken catchers were extracted and translated for use in these analyses. Procedures for the lay health advisor component of the project were also approved by the WFSM IRB.

Data Analysis

An iterative data analysis process was used, so that analysis started as soon as data collection began. Interview transcripts or notes were read by the study team, and topics were identified for further exploration by the data collectors. Once all data were collected, all the interviews were read by the team, following the approach of Agar [1980] to immerse in the data to get a general sense of the body of information. Then a list of codes was constructed for topics of interest, and mutually exclusive definitions were established. The general categories of codes were: general/inferred codes (e.g., power, documentation status), work and health (e.g., catcher job description, training, use of personal protective equipment, health concerns), exposures (e.g., work conditions, work organization, sanitation), and health care (e.g., self-treatment, use of drugs, company medical care).

Transcripts and notes were entered into Atlas ti (Version 5.0) text analysis software; codes were applied to chunks of text by one of the study team members. The coding was reviewed by two other team members and corrections and additions were made. A variable-based analysis [Ragin, 1987] was used, such that all segments from all data sources associated with relevant codes were extracted, reviewed, and summarized by one team member who included exemplary quotations. These summaries were reviewed by the lead author for consistency with the codes. Revisions of these summaries were made until they adequately reflected the interview content. Threats to validity (e.g., focus on extreme cases) were considered in constructing and revising the summaries [Miles and Huberman, 1994].

RESULTS

All catchers interviewed were male; most were married or living as married. They ranged in age from 18 to 47 and had been in the US for 1–12 years. Most were from Mexico; a few were from Guatemala. Two worked as crew leaders. About half were employed as contract labor through temporary employment agencies, and the remainder worked directly for one of the three poultry processing companies in the study area.

Activities of Chicken Catchers

A chicken catching team consists of 6–10 catchers, a supervisor or crew leader, and a forklift driver. The supervisor drives the team to the first chicken house they are assigned for the workday. When they arrive, they prepare

the house for clearing by pulling window curtains shut, moving large pieces of equipment (e.g., water fountains, fans) by pushing them to walls or raising them with a hand crank, and putting up portable fences to help corral the chickens.

When the house is ready, the forklift driver brings in several large, heavy, metal industrial chicken cages. The catchers place a block of metal $12'' \times 8'' \times 8''$ under each empty cage to tilt is so the chickens cannot escape. The main responsibility of chicken catchers is, as quickly as possible, to grab chickens and stuff them into the cages that will be driven to a processing plant. In one ''catch,'' a worker grabs between 6 and 13 chickens with a combined weight of 50–56 pounds. The number of chickens that a catcher grabs at a time depends on the size of the chickens, which range from 3 to 10 pounds depending on their age. The cages are about 4-feet high by 4-feet wide and 8-feet long. Each cage has a total of 15 individual boxes per cage. Each box has its own door and can hold 12–18 chickens (about two catches). Each cage, therefore, carries between 220 and 270 chickens. In the process of filling a cage, each worker on a team usually makes 8–10 trips to the cage carrying a catch of chickens. When one cage is full, the forklift driver removes it, loads it on the truck outside, and replaces it with an empty one. Each truck holds 20 or 22 cages, and a team will fill between 10 and 15 trucks over the course of a workday.

The catchers work as a team to fill the cages; they usually line up in pairs or groups of three with each group assigned to filling a specific section of a cage; one worker catches fewer chickens because he is assigned to open and close the cage doors. The intensity and speed with which a worker catches chickens varies with his order in this team lineup, and the workers change order throughout the day or over the course of a week. The easiest and most distinct job on the line is that of the herder or *espantador.* The herder is positioned at the end of the line of catchers in order to pick up the chickens that try to escape from the catchers and to keep the chickens from piling up in a group in an attempt to escape from the workers. If this happens, the chickens could die. The herder carries a stick and noise-making instruments, such as plastic bottles. The herder job rotates daily among the catchers; workers who have missed work may forfeit their turn, though injured workers may be given this job.

The forklift driver and supervisor are also part of the team, but they do not catch chickens. The driver deposits empty cages inside the chicken house and collects them when they are full, loading them on the truck outside. The supervisor drives the van, watches the catchers, and assists in preparing each house for being cleared. He monitors the lighting and the fans. He also fills out paperwork about the number of chickens caught at each house, the number of chickens killed in the process, and the time each crew and truck arrive and leave the house. Depending on the regulations of the company or contracting company that employs him, he also might provide coolers of water and sports drinks and personal protection equipment for the workers. The supervisor might join in the catching team when someone on the team misses work.

Chicken teams often empty more than one house a day, usually on different farms. During the drive between houses, the supervisor often stops at a fast-food restaurant or convenience store. Many workers report buying or seeing others buy alcohol, painkillers, and other drugs at convenience stores. These purchases include both legal and illegal purchases of painkillers. These are often consumed on the job.

The Work Environment

Chicken houses are noisy due to the combination of squawking chickens, the forklift, and the 6–10 large fans built into the walls that ventilate the house. Chicken houses are usually dark. Whether working a night or day shift, the supervisor turns off the lights and pulls curtains over the windows. The houses are kept dark because, when the chickens are exposed to light, they are supposedly more active and more difficult for the catchers to collect. Inside the chicken houses, the thousands of chickens, the catcher team, and the forklift stir up dust from the floors. In addition, strong odors and ammonia from a combination of accumulated feces, decaying dead birds, and troughs of animal feed are nauseating.

> Sometimes you feel that your nose is full of dust and the odor makes you vomit. There are some dead chickens that stink or the whole chicken house smells bad [P2].

Catchers report that one of the difficult aspect of the job is being able to tolerate the smell and the dust. The smell causes their eyes to water and get red; if they open their mouths, dust gets in their lungs.

In addition to the thick dust, the house is dirty because the dirt floor is often flooded with water, turning the dust to mud.

> Another thing that is bad about this job is that, sometimes, the water fountains leak and the floor gets wet and muddy. Additionally, the chickens get wet and the workers get all that mud on their faces. It's very uncomfortable to work when the chickens are wet [P4].

Infestations of bugs and spiders are also an issue, especially around the chicken litter.

Chicken houses are often extremely hot in the summer and very cold in the winter. Air conditioning and heating are rare. The fans are frequently turned off, despite the heat, because they are broken or deemed too dangerous for workers who might run into them. Some chicken houses have no fans at all. The ceilings in some of the houses are very low, which creates an uncomfortable working environment.

> [I]t's very hard to work there. Since we have to work in those houses all bent over, when we finish working, our backs hurt a lot [P5].

Workers face safety hazards that result in injuries, most notably from the forklift and large fans. The large cages obstruct the forklift driver's view, and, despite the dim lighting inside the house, the driver must leave the forklift's lights turned off.

> [S]ometimes the forklift has hit some workers. The forklift driver cannot see in front of him because of the cage he's carrying. This happens more to new workers because they are not aware of the forklift [P9].

Catchers must constantly be aware of the movement of these machines where they work or risk being hit. The fans are a hazard because of their large blades that are often not enclosed in a safety cover; they occasionally come loose from their fastenings on the wall and fall on workers.

> Months ago, a new worker cut his fingers with a fan. . .. The person who was the supervisor then sent the new worker to put the nets inside of one the chicken houses. When this worker was putting the nets, one of his hands touched one of the fans, which were on the sides of the chicken house, and he injured his fingers. The fan cut his fingers [P7].

Chicken houses contain large water fountains and chicken feeders, which are often suspended above the catchers. Workers have been hurt when the wires holding the feeders off the ground have broken and the feeders have fallen. Electrical cables on the floor put the catchers at risk of electrical shock, especially because these cables are difficult to see in the dim lighting.

The chicken house owners are responsible for the upkeep of these buildings. Conditions inside the houses depend in large part on the company with which the farmer has a contract and that company's payments and regulations.

> I think that if the company cared about us, they would have asked the farmers to fix all the problems in the chicken houses. There are some houses that are almost falling down with some posts that are broken, and nobody fixes them [P5].

Owners who are paid a higher price and are more closely regulated tend to have newer chicken houses that are kept in better repair and follow higher sanitation standards. Newer houses are more likely to be regularly vacuumed and have air conditioning, pipes that do not leak, and bathrooms instead of portable toilets for the workers.

Organization of Work

Compensation and benefits

Workers are either employed directly by the poultry company or by a contractor. Those who work for the poultry company receive some employment benefits and have access to the company's infirmary. They report getting paid overtime on days when the team returns late, works a second shift, or works on weekends:

> We don't get paid an hourly rate, but if we get [back] to the company after 11:30 a.m., we get paid overtime. I mean, anytime we work more than 8 hr, we get paid overtime. Also if we are sitting down waiting for the truck that is going to take the chickens, we get paid an extra $20. I clear $500 a week. Other benefits we receive are vacations. They give us 3% of our annual salary as vacation. We receive about $900 for each week of vacation. We get 2 weeks of vacation a year. We also receive dental and health insurance [P5].

They also say their wages are higher than those employed by a contractor. One supervisor for company-employed catchers reported:

> The workers I supervise are hired by the company. . .. The gross pay per week/per worker is $650–700. On average, we catch around 42,000 chickens per day. On the other hand, the people who are working for a contractor. . .are getting pay $350–400 per week, and they catch about 60,000 chickens per day. Their pay is in cash [P4].

The poultry companies reportedly only hire citizens or workers with ''good papers,'' but some undocumented workers are also unknowingly employed. When discovered, they are fired and often go to work for contractors.

Contractors also hire workers fired by the companies for drug use or other infringements. Workers employed by contractors generally do not receive any health or overtime benefits.

Pace of work

Chicken catchers are paid by the unit. This type of pay leads to increased pressure within teams. Because they are not held to a schedule, workers try to finish as quickly as possible. They work at such a speed that they rarely work a full day. New workers do not work as quickly, so they are often paid less for the first few weeks.

> In this job, we get paid by production. When we catch big chickens, we get pay $23 per 1000 per team. The small chickens are paid at $21 [P5].

> Nobody is telling us to hurry up, but we hurry up all the time because we want to finish the job earlier. We want to do the job in fewer hours. It's harder when we work fast [P10].

> The reason a lot of people catch chickens is because they don't have to work 8 hr a day [P4].

> When I started working here, the contractor asked me if I had worked as a chicken catcher before. I told them that I hadn't. Then he told me that I would be trained for 3 weeks and that my salary would be 50% less money during that period [P2].

New workers are also harassed by their team members. This type of interaction continues throughout a worker's employment.

> In the beginning, they don't treat you well. They want you to work at their pace, but, since you don't know how to do it, you can't. So they yell and fuss at you. In this environment you have to keep up with the team because if you don't, you get in trouble—not with the team leader, but with your co-workers [P1].

Interpersonal team dynamics

Outside of their treatment of new workers, chicken catchers report few power dynamics within the team. Excluding the supervisor and the forklift driver, they say that all team members are at the same level; no one is the leader. Within the team, the ability to work quickly is highly valued; seniority is valued only when it is associated with efficiency.

Supervisors are seen as wielding power over the other workers. Supervisors are paid more and can influence the team's pay. Workers often do not trust their supervisors to keep them safe.

> The supervisor sometimes doesn't know when the chickens are piling up because he is outside doing the paperwork. Then, since the company doesn't want to lose money, they blame us about it, and they take some money because of the dead chickens [P8].

> If seven chickens die per truck there is no problem, but if more than that die, then the company would discount some amount of money per dead chicken [P9].

> The supervisors are not the kind of people who care about us. The only thing they care about is that we do the job [P5].

Worker assessment of chicken catching

Despite their complaints about conditions and the company, many workers like the job of chicken catching, compared to other opportunities. This is mainly due to their wages and work hours, which generally range from 4 to 7 hr.

> The reason a lot of people catch chickens is because they don't have to work 8 hr a day. For example, at this moment, catching chickens is perfect for me. Sometimes I get home at about 8:30 a.m. and then, I go and pick up my daughter who is with my neighbor. I get to spend more time with her. This job is hard, but we can finish a house in about 2 hr. So, in the end, we only work for about 4 hr [P5].

Workers also note the stability of chicken catching, especially compared to other jobs available to immigrant workers.

> The chicken catcher job is a stable job. You work rain or shine. I used to work in construction and roofing, and we didn't work when it was raining or when it was very cold. And if you work in a

> factory you earn less money. I can tell you right now that I want to keep the job that I have [P2].

Workers' Health and Safety

Workers usually have no formal job or safety training. Despite this, most employers require that workers sign documents saying they have been trained. Some workers employed by contractors think that company employees are shown training videos, but participating company employees do not report seeing any of these.

> When we start working there, our co-workers teach us how to do the job [P6].

> They make us sign a paper that states that we were reminded of the dangers of the job [P4].

Workers think they do not work in a safe environment. Most view the forklift and cages as the most significant threats, and some mention electrical cables.

> I was hit by one of the cages that the forklift was holding. He was trying to place it on the floor, and I was close to the cage, and he didn't see me. We have to pay attention when we are close to the forklift [P2].

> [O]nce the forklift hit the fastener that holds the fans and the fan came loose and hit the back of an American who was under it. He was hurt, but, at the same time, he was lucky that the fan didn't go all the way to the ground and the impact was minimal [P5].

> Sometimes, on the floor there are some electrical cables of the fans or lights that are damaged, and when we step up on them, we get electrical shocks. We cannot see the cables on the floor because the houses are dark. I have seen and heard some of my co-workers jumping up and screaming because of the electrical shocks [P3].

Workers frequently slip and are scratched by chickens. The dust and ammonia bother catchers, and a few think there may be health effects from them, though they do not know what these effects would be.

> I think the ammonia is very dangerous for our lungs**...** I don't know if [the dust] causes emphysema or something else. There is a lot of dust inside the chicken house [P7].

Of the health effects from their job, chicken catchers are most concerned about those affecting their backs and hands. Workers attribute back pain to their repetitive lifting and working in awkward postures. Most workers say their hands hurt regularly. Because of chicken scratches, workers' hands are at risk for infection. Their hands are also swollen, causing many workers to be self-conscious about the appearance of their hands.

> [Y]ou feel that the bones in your hands hurt a lot, especially when you start your shift when your fingers are cold. When you finish working, your fingers are so stiff it's hard for you to bend them [P1].

> I think that my fingers are the ones that could be affected because, sometimes, they hurt during the night and also my hands get cramped. Sometimes, when I'm eating, my hands get cramped, and if I'm holding a spoon, it will fall out of my hand [P9].

> Sometimes our fingers get infected. Some people have had surgery because of those infections. They get some kind of sores [P5].

> Our fingers are very swollen, and I don't know if this could cause an illness in the future. ... I really feel bad because people look at me, and they talk about my hands. I think they ask themselves what had happened to me [P3].

> The bad thing is that in the future my fingers can be deformed. Well, they are already deformed [P2].

Many workers commented on the amount of drugs involved with chicken catching. Some dislike even the over-the-counter drugs used, but most consider those necessary and commonplace.

> What's wrong with the workers I [supervise] now is that they take too many pills—ibuprofen and Advil—because they complain of back pain [P4].

Workers report that alcohol is frequently consumed on the job.

> In our job we are allowed to drink. . .. Our supervisor takes us to the store to buy beer. Well, he takes us to buy food, but we buy beer. . .. The supervisor's attitude is that you can drink all you want as long as you do the job. He gets mad only when people don't want to do the job. I know that [company] doesn't allow drinking on the job, but the supervisor doesn't care, as long as you do your job [P5].

> Some workers come to work drunk on Mondays. I have heard that chicken catchers who work at [company] drink alcohol while they are working. One of my co-workers used to work there, and he said that when the van stopped in the grocery store, each worker bought a 12 pack of beer [P9].

> When I used to work in the evenings, we used to buy some beers, but not now. We cannot do it because we leave home at 3:00 a.m., and at that time, the convenience stores are closed [P10].

Workers also say that illicit drugs are common. Sometimes these are used to increase energy and job performance. Other times these are used as painkillers. Although many workers use drugs of some sort, most dislike its common and excessive use.

> Some of the workers take a little pack of powder, which they get in a gas station, to have more energy [P10].

> Some workers take pills to have more energy because they want to have their salary increased. One time, I bought some pills that have a picture of a bee, and I took them for 2 days [P6].

> The workers also take a lot of ephedrine, the same one the tractor trailer drivers take to stay awake [P4].

> The ones who are sick go to the doctor, and he prescribes the pills. I know somebody who the doctor prescribes about 130 pills monthly. Then, he doesn't take all of them. He sells them. He sells the [oxycontin] for about $25, but it varies according to the strength. The ones that are 15 mg are sold for $25 and the ones that are 10 mg are sold for about $20. There are pills that cost $3 and others cost $5. The ones that cost $3 nobody wants. Some people buy the ones that cost $5 [P5].

DISCUSSION

The job of chicken catching is physically demanding. The task to be completed—catching and caging large numbers of chickens—requires speed, dexterity, strength, and stamina. The circumstances under which the task is performed—both the physical environment and the organization of the work—exacerbate its difficulty. Many aspects of the physical environment and the organization of work emphasize the health and safety of the chickens, so as to minimize damage to what will ultimately become human food. As noted over a quarter century ago by Lenhart and Olenchock [1984], comparatively less attention has been paid to health of workers. In the intervening years, workers in processing plants have received greater attention [e.g., Quandt et al., 2006; Cartwright et al., 2012; Mirabelli et al., 2012], but chicken catchers in CAFOs are still largely ignored.

Injuries from forklifts operating at high speeds and without full headlights, fans, and feeders held precariously aloft by cables, and electric cords in water all pose safety hazards that increase the risk of unintentional injuries. While workers in the present study are aware of such risks and recount stories of injuries, few reports exist in the literature. An exception is the report of two workers electrocuted during the summer of 1999 [UFCW, 2000]. The best-documented exposures of the physical environment are respiratory exposures to bioaerosols, particulates, and gasses, including inhalable dust, endotoxin, bacteria, mold, ammonia, and animal dander. Exposure estimates in the US and elsewhere note the dangerous levels of inhaled substances [Lenhart and Olenchock, 1984; Lenhart et al., 1990; Nielsen and Breum, 1995; Golbabaei and Islami, 2000; Donham et al., 2002; Kirychuk et al., 2006; Rylander and Carvalheiro, 2006; Oppliger et al., 2008; Rimac et al., 2010; Just et al., 2011]. Comparisons over the life cycle of poultry conclude that exposures increase significantly during the final fattening period, so that catchers receive the highest exposures of all workers in poultry houses [Oppliger et al., 2008]. There is evidence of synergy between contaminants. Ammonia gas is presumed to adhere to dust particles, which are carried deep into the lungs, increasing the toxic effect of ammonia [Senthilselvan et al., 2011]. Comparisons between catchers and forklift operators show that the former have significantly more exposure to inhaled particulates [Nielsen and Breum, 1995]. The health effects of these respiratory exposures include higher incidence of chronic phlegm, toxic pneumonitis, airway inflammation, and chronic

bronchitis; decline in ventilator lung function; higher IgG antibodies; and higher prevalence of nasal, eye, skin, and asthma symptoms [Kirychuk et al., 2006; Rylander and Carvalheiro, 2006; Rimac et al., 2010]. Most studies recommend use of respiratory protection, while noting that workers, as in the present study, use none.

Several features of how chicken catching is organized place physical and mental demands on workers. The job design is such that the pace of work is intense, tasks are repetitive, individual workers have little control over their work pace, and hence, they experience job strain. Forklifts bring empty cages and take away loaded ones rapidly. There is peer pressure to fill cages as fast as possible. Workers report stimulant use to maintain the work pace. The only breaks occur when driving to the next barn or when waiting for a truck of cages to arrive. Previous research in other industries has shown that an intense pace of work with little control is linked to injury and illness [e.g., Hansen, 1982; Kivimäki et al., 2002].

The lack of control over the job is evident through the descriptions provided by the catchers in this study. The company decides which and how many chicken houses will be emptied on a given day, and the supervisor transports workers from site to site. Within the team, individual catchers must work at the same pace as other workers, and are subjected to harassment if they fail to keep up.

The piece-rate rather than hourly payment system contributes to job stress, as there is pressure to work fast and shorten the workday. Research on piece rate wages and health and safety shows a strong association between piece rate and negative health outcomes across a wide variety of industries [Johansson et al., 2010]. These health outcomes result from factors such as greater risk behavior, higher physical loads, and drug use, which lead to exhaustion, unintentional injuries, mental health complaints, pain, and a variety of occupational injuries. While numerous industries have been studied, none have involved poultry processing workers. Nevertheless, the weight of evidence from other studies suggests that the piece-rate wage system in chicken catching places workers at risk for a variety of injuries.

As is the case with other analyses of piece rate labor [Green and Heywood, 2008], the catchers interviewed in the present study found specific benefits that appeared to outweigh, in their minds, hazards of the system. They could, to a certain extent, control the length of their workday, often putting in fewer hours than other types of jobs available locally. This shorter workday allowed them to have greater leisure time or time to devote to family obligations.

While this study did not collect direct evidence of the health outcomes of chicken catching, the catchers interviewed seemed to be mixed in their acceptance of injuries and illness as part of the job. Some minimized its importance, while others noted that the chicken producers or their employer could take steps to reduce injury risks for catchers. Importantly, the catchers as a group had not received any training that taught them the hazards of their job or provided information with which they could protect themselves.

These findings should be considered in light of their limitations. Data were collected from a relatively small sample of chicken catchers in a limited geographic area. About a third of those known to be employed as catchers could not be scheduled for interviews or refused; these workers may have differed from those interviewed in ways that could bias the results. Field staff notes indicate that those who refused appeared afraid that they might be fired if their employers learned of their participation. Health effects were not corroborated with physical examinations. Independent observation of working conditions was not possible. Nevertheless, the use of qualitative data analysis techniques provided opportunities to evaluate the similarities in description of conditions and behaviors across workers from different catcher teams and for different companies, providing greater assurance that worker descriptions were accurate.

Chicken catching represents a 3-D job resulting from the vertical integration of the modern poultry industry. With the increase in immigrants in the rural labor force, these jobs are increasingly held by immigrants. Such workers are legally and economically vulnerable. Many do not have the proper documentation to be in the US, a factor that can be exploited by employers and supervisors [Marín et al., 2009a]. They experience precarious employment, as they are frequently employed as contractors by temporary worker agencies, rather than by the poultry processing companies themselves. These conditions result in a labor force that is willing to endure the 3-D conditions in exchange for a chance to earn greater pay than is afforded by other locally available jobs. In an industry with very low profit margins, change is unlikely without regulatory intervention. Chicken producers are not likely to improve working conditions or implement engineering controls to prevent catcher injury or illness. Poultry processors are not likely to change aspects of the work environment or organization of work geared toward the health of chickens rather than workers or remove incentives to keep workers in these jobs. Although mechanical chicken catching machines are available, they represent a very large and long-term investment beyond the reach of most chicken producers and unlikely to be made when low cost labor is available. Short of such changes to these 3-D jobs, workers need more information on the long-term health effects of their jobs. Current research is limited to respiratory effects, but musculoskeletal, dermatological, and mental health effects are also likely. Additional research is needed to fully understand the health effects of chicken catching.

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