

U.S. Department of Labor

Occupational Safety and Health Administration
Oklahoma City Area Office
5104 N Francis Avenue, Suite 200
Oklahoma City, OK 73118



December 1, 2021

Seaboard Foods, LLC
Attn: Rick Sappington (Plant Manager)
2700 Cactus Drive
Guymon, OK 73942

Re: Inspection #1534564

Mr. Sappington

An inspection of your workplace at 2700 Cactus Drive, beginning on June 1, 2021, was conducted pursuant to a complaint filed with the Oklahoma City Area Office. The complaint alleged the following with respect to ergonomics:

"Employees are exposed to ergonomic issues and musculoskeletal disorders (MSDs) on production lines. The employer has not properly recorded injuries on its OSHA 300 logs."

The investigation included (1) a review of OSHA 300, 300A, and 301 injury and illness recordkeeping forms for years 2018 – 2021 year to date, (2) private employee interviews, (3) management interviews, (4) review of your company's overall ergonomic hazard control efforts, (5) review of employee medical documents including first aid logs and treatment logs, and (6) analysis of photographs, videos, measurements and evaluations of eight job/tasks.

Findings

Based on the review of the injury and illness information and interviews with employees, the following specific jobs of concern within the facility were selected for a detailed analysis: stack-off, trimming ribs, packing ribs, removing backbone/ribs, packing butts, opening picnics, hanging heads, and trimming diaphragm. (A general duty clause citation was issued related to the Walmart Stack-Off Area, therefore recommendations and discussion related to that area are not included in this letter.)

- Employees performing these jobs have experienced significant injuries/pain to areas of the body such as the shoulders, elbows, forearms, wrists, and fingers/digits.
- Multiple ergonomic risk factor analyses performed indicate these jobs present elevated risk for development of work-related musculoskeletal disorders (WMSDs), specifically distal upper extremity (DUE) disorders and lower back disorders.

We have determined that employees performing the jobs analyzed are being exposed to ergonomic risk factors/stressors that are likely contributing to the development of WMSDs.

- Employees performing the trimming ribs, removing backbone/ribs, opening picnics, and trimming diaphragm jobs are exposed to ergonomic risk factors including, but not limited to: awkward postures, hand grip forces in excess of 40% of their maximum grip strength, rates of repetitions every 5 seconds, and lack of time to recover.
- Employees performing packing ribs, packing butts, and hanging heads jobs are exposed to ergonomic risk factors including, but not limited to: awkward postures, reaches beyond 25 inches, reaching at or above shoulder height, hand grip forces in excess of 40% of their maximum grip strength, rates of repetitions every 5 seconds, and lack of time to recover.

RISK FACTORS OBSERVED

- *Awkward Postures* – Non-neutral postures were noted to include forward reaches beyond 25 inches, arms raised above shoulder height, trunk/torso forward flexion in excess of 30 degrees, and ulnar wrist deviations.
- *High hand grip forces* – Employees normalized peak hand forces were estimated using a Jamar Hand Dynamometer. Employees were asked to squeeze the dynamometer with maximum force, and again with the force typically used while performing their jobs. The percent maximum voluntary contraction (MVC) was then calculated by dividing the force used on the job by the maximum. This was performed for the employee's dominant hand only. MVC values for trimming ribs, packing butt, and removing backbone/ribs ranged from 40% to 80%. A general guideline for hand force work is to maintain less than 20% MVC for repetitive work and less than 10% MVC for highly repetitive work.
- *Elevated rates of repetition* – The video taken during the onsite was analyzed to determine the rate of repetition for the tasks mentioned above. The number of hand exertions per minute was determined to be approximately 12 for trimming ribs, 22 for packing ribs, 24 for removing backbone/ribs, 12 for packing butts, 44 for opening picnics, 20 for hanging heads, and 40 for trimming diaphragms.
- *Lack of recovery/extended work duration* – All job tasks observed were comprised of highly repetitive, short duration movement with few opportunities for periods of recovery. The upper bodies of workers were observed to be in a steady, and often rapid, motion. Recovery-time to work-time ratio is 0.125 based on an 8 hour work shift and 1 hour break time (30 minute lunch and two 15 minute breaks), and no job rotation. The exception to this is hanging heads where the two employees trade out every 10 heads, giving them a 30 second break every minute.

RISK FACTOR ANALYSIS

Trimming ribs, packing butts, and removing backbone/ribs were evaluated using the Revised Strain Index (RSI). The RSI assesses jobs for risk of work related musculoskeletal diseases of the distal upper extremities specifically the hand, wrist, and elbow. The tool assesses six job risk factors for each arm through the assignment of categories linked to numerical ratings. Only the employee's dominant hand was evaluated.

Table 1 contains the Revised Strain Index (RSI) risk factors for performing various production tasks.

Table 1. RSI scores

Job/Task	Score	Score Interpretation
Trim Ribs – Employee 1	7.5	Scores greater than 10 are considered hazardous
Trim Ribs – Employee 2	20.3	
Pack Butt	51.0	
Remove Backbone-Ribs	60.3	

JOB HAZARDS OBSERVED AND POSSIBLE SOLUTIONS

Trim Ribs

Potential Hazards

Rib Trimmers must repeatedly reach out with full arm extension to retrieve the rib slabs. This position forces employees to support the weight of the arm and rib slab with the arm fully extended and the body flexed forward (see Figure 2). Trimmed ribs are placed in an opening located at waste level; occasionally employees toss the trimmed ribs to a conveyer belt located at shoulder level. Repeatedly pulling the elbow away from the torso, by reaching out and up, forces the shoulder to support weight in a weak, unstable posture and repeatedly pulls the tendons over the bony entities in the shoulder. Additionally, the rib trimmers must deviate the wrist while exerting significant finger force to pull the knife back towards their body to perform the cutting action since the draw knife has a straight in-line handle. These motions increase the risk of development of acute and chronic MSDs to the shoulder, upper arm and neck.

Line speed was estimated at 420 pieces per hour based on the employee observed.



**Figure 2 – Picking Ribs from Conveyer
Belt**

Possible Solutions

- Educate employees on the importance of maintaining the wrist in an ergonomically neutral position.
- Ensure the consistent use of the sharpest knives possible through the utilization of quantitative knife sharpness testing technologies. These technologies can evaluate and help refine knife sharpening techniques and practices. Develop knife change out schedules to better ensure the sharpness of the knives being used in the facility.
- Provide bent handle knives, which permit execution of the task while maintaining the hand in a neutral posture and provides the ability to use a power grip
- Low coefficient of friction tool handles and gloves require employees to use additional finger force to maintain control of the tool. Increases in the force exerted by the fingers increases the risk of damage to the musculoskeletal system of the fingers, hand and arm. Textured knife handles improve grip and reduce hand force. Knife handles with hand straps allow the worker to maintain control of the knife while relaxing the fingers on the handle. A lower guard to stop the hand from sliding off the handle reduces grip force. Make sure gloves fit properly and do not decrease tactile sensitivity. Use gloves made of a material which increases the coefficient of friction between the hand and the load surface. This will reduce the hand and finger force required to perform a particular repetitive task.
- Classify jobs as to the nature and extent of exertion and create a rotation schedule that allows for as much variation as possible in the distribution and frequency of musculoskeletal activity.
- Develop and enforce work-rest schedules. Generally, a minimum of a 15 minute rest break at least every two hours is required.

Packing Ribs

Potential Hazards

Employees boxing bagged ribs have to repeatedly reach out to full arm extension at or above shoulderheight to retrieve bagged ribs. The boxing rack is lower than the bagging rack, contributing to the arm extension and reach (see Figure 3).

Further, employees bagging ribs have to repeatedly reach out to full arm extension and up to about shoulderheight to toss bagged ribs (see Figure 4). Employees repeatedly lift bags to shoulder height and shake them to “settle” the ribs in the bags. Repeatedly pulling the elbow away from the torso, by reaching out and up, forces the shoulder to support weight in a weak, unstable posture and repeatedly pulls the tendons over the boney entities in the shoulder. Performing this task in this manner greatly increases the risk of development of MSDs of the shoulder and upper back.

Line speed was estimated at 480 pieces per hour based on the employee observed.



**Figure 3 – Boxing
Ribs**



**Figure 4 – Tossing Bags of
Ribs**

Possible Solutions

- Position boxing racks such that employees do not need to lift the hand above shoulder height to access product or reach farther than 18 inches in front of the body. Alternatively, position employees on height adjustable stands such that they can perform the task while maintaining reaches within ergonomically desirable ranges. Generally, employees should work within a range of approximately waist height to shoulder height vertically and should limit reaches to 15 inches horizontally.
- Place employees at bagging stations in such a manner that when the product is bagged it can be placed on the bagging rack without lifting the hand above shoulder height and without reaching farther than about 15 inches in front of the body.

Removing Backbone/Ribs

Potential Hazards

Employees removing the backbone and back ribs use a straight, in-line knife to perform the operation. This operation is performed with the wrist in a relatively neutral position. Significant finger force is still required to maintain adequate control of the knife (see Figure 5). Exerting finger force creates a contact stress to the tendon and sheath as they are pulled against and over the bony and ligamentous entities in the wrist. These actions can lead to fraying, irritation and swelling of the tendons and the surrounding tissues. Repeatedly performing tasks such as these while exerting finger force increases the risk of development of MSDs of the fingers (trigger finger) wrist (carpal tunnel), hand (ganglion cyst), and elbow (epicondylitis).

Line speed was estimated at 300 pieces per hour based on the employee observed.



**Figure 5 – Removing
Backbone/Ribs**

Possible Solutions

- Educate employees on the importance of maintaining the wrist in an ergonomically neutral position.
- Ensure the consistent use of the sharpest knives possible through the utilization of quantitative knife sharpness testing technologies. These technologies can evaluate and help refine knife sharpening techniques and practices. Develop knife change out schedules to better ensure the sharpness of the knives being used in the facility.
- Provide bent handle knives, which permit execution of the task while maintaining the hand in a neutral posture and provides the opportunity to use a power grip.
- Low coefficient of friction tool handles and gloves require employees to use additional finger force to maintain control of the tool. Increases in the force exerted by the fingers increases the risk of damage to the musculoskeletal system of the fingers, hand and arm. Textured knife handles improve grip and reduce hand force. Knife handles with hand straps allow the worker to maintain control of the knife while relaxing the fingers on the handle. A lower guard to stop the hand from sliding off the handle reduces grip force. Make sure gloves fit properly and do not decrease tactile sensitivity. Use gloves made of a material which increases the coefficient of friction between the hand and the load surface. This will reduce the hand and finger force required to perform a particular

repetitive task.

- Classify jobs as to the nature and extent of exertion and create a rotation schedule that allows for as much variation as possible in the distribution and frequency of musculoskeletal activity.
- Develop and enforce work-rest schedules. Generally, a minimum of a 15 minuterest break at least every two hours is required.

Pack Butts

Potential Hazards

Employees packing butts must lift butts to upper-chest, and in some cases shoulder height to place them on the bagging chute (see Figure 6). Repeatedly lifting the arm to elevations that pull the elbow away from the torso forces the shoulder to support weight in a weak, unstable posture and repeatedly pulls the tendons over the boney entities in the shoulder.

Line speed was estimated at 540 pieces per hour based on the employee observed.



Figure 6 – Packing Butts

Possible Solutions

- Position employees on height adjustable stands such that they can perform the task while maintaining reaches within ergonomically desirable ranges. Generally, employees should work within a range of approximately waist height to shoulder height vertically and should limit reaches to 15 inches horizontally.
- Low coefficient of friction gloves require employees to use additional finger force to maintain control of the tool. Increases in the force exerted by the fingers increases the risk of damage to the musculoskeletal system of the hand and arm. Make sure gloves fit properly and do not decrease tactile sensitivity. Use gloves made of a material which increases the coefficient of friction between the hand and the load surface. This will

reduce the hand and finger force required to perform a particular repetitive task.

Open Picnic

Potential Hazards

Employees opening picnics use a straight, in-line knife in one hand, and a t-handled hook in the other to perform the operation. This operation is performed with the wrists in a relatively neutral position. Significant hand force is still required to maintain adequate control of the knife and hook (see Figure 7). Using a power grip on a hard handle creates a contact stress to the palm, static finger flexion with wrist movement pulls the tendons against and over the bony and ligamentous entities in the carpal bones. These actions can lead to fraying, irritation and swelling of the tendons. Repeatedly performing tasks such as these while exerting finger force increases the risk of development of MSDs of the fingers, wrist, hand and elbow.

Line speed was estimated at 660 pieces per hour based on the employee observed.



Figure 7 – Opening Picnic

Possible Solutions

- Educate employees on the importance of maintaining the wrist in an ergonomically neutral position.
- Ensure the consistent use of the sharpest knives possible through the utilization of quantitative knife sharpness testing technologies. These technologies can evaluate and help refine knife sharpening techniques and practices. Develop knife change out schedules to better ensure the sharpness of the knives being used in the facility.
- Low coefficient of friction tool handles and gloves require employees to use additional finger force to maintain control of the tool. Increases in the force exerted by the fingers increases the risk of damage to the musculoskeletal system of the hand and arm. Textured knife handles improve grip and reduce hand force. Knife handles with hand

straps allow the worker to maintain control of the knife while relaxing the fingers on the handle. Make sure gloves fit properly and do not decrease tactile sensitivity. Gloves should be made of a material which increases the coefficient of friction between the hand and the load surface. This will reduce the hand and finger force required to perform a particular repetitive task.

- Classify jobs as to the nature and extent of exertion and create a rotation schedule that allows for as much variation as possible in the distribution and frequency of musculoskeletal activity.
- Develop and enforce work-rest schedules. Generally, a minimum of a 15 minute rest break at least every two hours is required.

Hanging Heads

Potential Hazards

Employees hanging heads must perform a straight cut and then lift an approximately 10 pound head at or above shoulder height to hang it on a hook. Repeatedly lifting the arm to elevations that pull the elbow away from the torso forces the shoulder to support weight in a weak, unstable posture and repeatedly pulls the tendons over the bony entities in the shoulder. Additionally, the heads are slippery requiring hand/finger forces in excess of 20% MVC creating contact stress to the tendon and sheath as they are pulled against and over the bony and ligamentous entities in the wrist. These actions can lead to fraying, irritation and swelling of the tendons and the surrounding tissues.

Repeatedly performing tasks such as these while exerting grip forces increases the risk of development of MSDs of the wrist, hand and elbow.

Line speed was estimated at 660 hogs per hour based on the employees observed.

Possible Solutions

- Low coefficient of friction tool handles and gloves require employees to use additional finger force to maintain control of the tool. Increases in the force exerted by the fingers increases the risk of damage to the musculoskeletal system of the hand and arm. Make sure gloves fit properly and do not decrease tactile sensitivity. Use gloves made of a material which increases the coefficient of friction between the hand and the load surface. This will reduce the hand and finger force required to perform a particular repetitive task.

Trim Diaphragm

Potential Hazards

Diaphragm trimmers must repeatedly reach out with full arm extension into the carcass to cut out the diaphragm. This positioning forces employees to support the weight of the arm with the arm fully extended and the body flexed forward. These motions increase the risk of development of acute and chronic MSDs to the shoulder, upper arm, and neck.

Diaphragm trimmers use a straight, in-line knife to perform the operation. The use of this type of tool forces employees to deviate the wrist while exerting finger force to maintain adequate control of the knife. Exerting finger force with the wrist in a deviated posture creates a contact stress to the tendon and sheath as they are pulled against and over the bony and ligamentous entities in the wrist. These actions can lead to fraying, irritation and swelling of the tendons and the surrounding tissues. Repeatedly performing tasks such as these, which require deviation of the wrist while exerting finger force increases, the risk of development of MSDs of the wrist, hand and elbow.

Line speed was estimated at 1140 hogs per hour based on the employee observed.

Possible Solutions

- Educate employees on the basics of body biomechanics and the importance of maintaining the wrist in an ergonomically neutral position.
- Ensure the consistent use of the sharpest knives possible through the utilization of quantitative knife sharpness testing technologies. These technologies can evaluate and help refine knife sharpening techniques and practices. Develop knife change out schedules to better ensure the sharpness of the knives being used in the facility.
- Provide bent handle knives, which permit execution of the task while maintaining the hand in a neutral posture.
- Low coefficient of friction tool handles and gloves require employees to use additional finger force to maintain control of the tool. Increases in the force exerted by the fingers increases the risk of damage to the musculoskeletal system of the hand and arm. Textured knife handles improve grip and reduce hand force. Knife handles with hand straps allow the worker to maintain control of the knife while relaxing the fingers on the handle. Make sure gloves fit properly and do not decrease tactile sensitivity. Gloves should be made of a material which increases the coefficient of friction between the hand and the load surface. This will reduce the hand and finger force required to perform a particular repetitive task.
- Classify jobs as to the nature and extent of exertion and create a rotation schedule that allows for as much variation as possible in the distribution and frequency of musculoskeletal activity.
- Develop and enforce work-rest schedules. Generally, a minimum of a 15 minute rest break at least every two hours is required.

RECOMMENDATIONS AND ABATEMENT CONSIDERATIONS

The Revised Strain Index scores indicate moderate to high ergonomic risks in the jobs/tasks observed. Additionally, the jobs/tasks observed have the highest incident rate of visits to the first aid station.

- Conducted an ergonomic assessment by a certified professional ergonomist, industrial engineer, or other qualified professional. In particular this assessment should include: trimming ribs, packing ribs, removing backbone/ribs, packing butts, opening picnic, hanging heads, trimming diaphragms, and stack-off of cases in excess of 50 pounds. The ergonomist, or other qualified professional, shall provide a job hazard analysis and recommendations for reducing or eliminating ergonomic risk factors from the work of the employees performing repetitive hand activity and heavy or awkward lifting. Implement controls to eliminate the hazard or reduce the hazard to more acceptable levels.

Develop an ergonomic program which includes the following six elements:

1. Management leadership

2. Employee engagement
 3. Training
 4. Hazard analysis and control
 5. Medical management
 6. Process evaluation
- Employee engagement should include a participatory ergonomics team. The composition of the team should be multi-disciplinary, including hourly employees, union representation, plant management, engineering, maintenance, medical, and safety. Provide the team with training to achieve a basic competence in ergonomic hazard identification, principles, and risk reduction approaches with ongoing training and education. The team should solicit employee suggestions and follow-up on resolution to the suggestions; provide input to changes in layout and hand tool selection; and consult a certified professional ergonomist or other qualified professional to review repeated concerns and conduct independent and joint audits.

Engineering controls for repetitive kill and cut tasks

- Evaluate individual stations for the addition of adjustable height platforms. Platforms should be adjustable to the appropriate height for the employee and have a foot rail to alleviate the stress of prolonged standing. Adjust the stands in between rotations to ensure employees are working with minimal stressors caused by awkward shoulder and hand positions. Train employees on how work height affects posture. During new employee training, employees should demonstrate that they can adjust the work platform to a height that minimizes awkward neck, back, shoulder and wrist postures. Numbering the slots on the work platform stand will allow height adjustments to be easily replicated.
- Provide knives with ergonomic handles for repetitive tasks to reduce awkward hand postures. Provide a strap on the handle to allow the fingers to relax between pieces of meat.
- Increase knife sharpening frequency on and off the lines to reduce force requirements to less than 10% of maximum grip strength. Position knife sharpeners to reduce reaching and minimize awkward shoulder and hand postures. Allow employees to get a sharp knife as needed and develop a knife sharpening program to include a schedule for replacing knives, inspection procedures to ensure sharpness, proper sharpening techniques, and procedures for employees to request sharpening or a new tool if it can't be sharpened by them. Include spare knives on the lines so dull or worn ones can be removed immediately. Implement knife replacement standards that specify end of life indicators for triggering replacement. Replace knives based on usage or damage. Employees should be trained on the sharpening program, frequency of sharpening, and how to properly sharpen.
- Monitor the training line so new hires can be trained on the proper position, height, and technique without torso twisting and the stress of keeping up with the line speed. Develop a work hardening program for employees on the training line to progressively increase the amount of time cutting, in order to strengthen muscles and reduce soreness and pain. Use the training line to condition employees returning from an absence of two or more weeks.

- Update the job hazard analysis of the production line and case stacking jobs to include quantitative analysis.

- On the butt packing line redesign the transition from the conveyor to the packing station to allow the butts to slide from the conveyor to the bagger to avoid lifting. Provide a tool with an ergonomic handle for a power grip to pull the butt off the conveyor to the bagger.

Administrative controls

- Educate all employees including management about basic ergonomics principles and proper body positioning. Training should be conducted prior to assignment and periodically throughout the year to reinforce the importance of the ergonomic measures and their wellbeing. Training should emphasize proper techniques including work height and grip and increase the understanding of the importance of avoiding harmful and hazardous postures and procedures. Train new hires and temporary employees on how to work in neutral postures, to keep wrists straight, use of maximum grip strength, and why deviations from these positions lead to injuries. Provide equivalent training for management (line leaders and supervisors included) since they can assess and encourage proper work techniques. Training will also increase their knowledge of the subject allowing them to make better purchasing and work organization decisions. Maintenance personnel also need this type of training since they often adjust and maintain equipment, to include production workstations, and can be an invaluable source of ideas on equipment modifications to reduce hazards to the employees.
- Develop and implement a rotation schedule for each department with ergonomic stressors in order to minimize employees being rotated to positions with similar muscle use and tool use. Rotations should be to other tasks to prevent continuous use of the same tool. Incorporate micro-breaks during each task rotation to allow employees time to stretch and rest muscles.
- Provide a quantitative ergonomics risk assessment of the repetitive tasks using the strain index, ACGIH hand activity level for repetitive hand activity and the ACGIH Upper Limb Localized Fatigue analysis for arm and shoulder hazard assessments. Use the NIOSH lifting equation to assess manual lifting tasks.

RESOURCES

Ergonomics Program Management Guidelines for Meatpacking Plants. OSHA publication 3123, www.osha.gov/publications/OSHA3123

Prevention of Musculoskeletal Disorders in Poultry Processing, OSHA publication 3213, www.osha.gov/sites/default/files/publications/OSHA3213.pdf

NIOSH Elements of an Ergonomic Programs, www.cdc.gov/niosh/topics/ergonomics/ergoprimer/default.html

Ergonomics Guidelines for Manual Material Handling, https://www.dir.ca.gov/dosh/dosh_publications/mmh.pdf

Applications Manual for the Revised NIOSH Lifting Equation, https://www.dir.ca.gov/dosh/dosh_publications/mmh.pdf

To evaluate your efforts in reducing these hazards, please send me a letter detailing the actions you have taken, or plan to institute, to address our concerns within 60 days of the date of this correspondence. We will review your response and determine if a follow up is needed to further evaluate your workplace, including any recommended/implemented controls.

Under OSHA's current investigation procedures, we may visit your work site within six months to examine the conditions noted above. Enclosed is a list of available resources that may be of assistance to you in preventing work-related injuries and illnesses in your workplace.

Thank you in advance for your attention to these concerns. Working together, we can move closer to achieving the goal of workplaces free of preventable hazards. If you have any questions, please feel free to call the Area Office at (405) 608-4160.



Steven A. Kirby Area
Director

cc: Mayra Carbajal, Union Representative UFCW District Union Local 2
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