

Module 3 – Your Job Doesn't Have to Be a Pain: Avoiding Injuries Using Ergonomics

Session 1: Using Ergonomics

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Your Job Doesn't Have to Be a Pain consists of one session:

Session 1 – Using Ergonomics

MODULE OBJECTIVES:

- Define ergonomics
- Create awareness of impact
- Recognize factors involved
- Learn methods of prevention

Session 1 – Using Ergonomics

In support of an awareness of a culture of safety and in pursuit of the goal of an injury-free workplace, protecting the worker from injury is a shared responsibility between both employer and employee. A workplace that makes safety as a top priority and who has created a culture of safety is one that has an ongoing effort to implement engineering and administrative controls regarding identified hazards. In addition to engineering and administrative controls, PPE is a type of ergonomic control.

Employers use these controls to prevent musculoskeletal disorders (MSD's) caused by poor work design and practice. The method commonly used for the prevention of MSD's is ergonomics.

What is ergonomics? Ergonomics is:

- The study of how to bring the work to the worker,
- It's about making the workplace better fit the employee,
- It involves the design of tools, equipment, workstations and job tasks,
and
- It is an effective way to reduce the number and severity of workplace injuries.

To refresh, engineering controls are those changes that are made to eliminate a hazard. This would be, for example, using an adjustable work stand, to prevent improper reaching. Administrative controls are situations where employers modify workplace policies and procedures for performing work. Rotating workers in positions that are very physically demanding like deboning chicken would be an example of an

administrative control. Lastly, PPE is that protective equipment placed on the worker's body. Gloves would be an example of a PPE.

According to recent reports, almost 70% of OSHA inspections result in a citation. This can cost a facility \$7,000 for a serious violation. If the violation is "willful" or "repeated", multiply that number by 10. It is easy to see how safety through prevention saves. If ergonomics is neglected in the workplace, it could lead down a path to injuries, but one of absenteeism, high turnover rates, a reduction of quality of product, and ultimately an increase in costs.

Cumulative trauma disorders are injuries that can result from a path of ergonomics-neglected. There are a number of things that can contribute to cumulative trauma disorders. They develop gradually from repeated stress to a particular body part. Such disorders are also called "overuse" or "wear-and-tear" repetitive strain disorders.

When attempt to prevent MSD's and cumulative trauma disorders, it is important to understand the factors associated with ergonomics. Working in the poultry industry, especially in the areas of cutting and deboning, can create added stress on the body. Factors to consider are:

- Force
- Repetition
- Postures (Awkward & Static)
- Vibration
- Contact Stress

Force

Force is an ergonomic stressor caused by lifting, pushing, pulling, grasping and pinching items in the work environment. Lifting heavy objects high, outside a person's normal range of reach, places force on the back as well as the neck and shoulders. Force is often required to handle and control equipment, tools, raw materials and finished products. Tasks that require forceful exertions that don't result in acute injury place higher loads on the joints and connective tissues. Prolonged or recurrent exertions of this type can cause feelings of fatigue and may lead to musculoskeletal problems when there isn't adequate time for rest or recovery.

For example, force required to make a particular cut either with a knife or scissors, can contribute to cumulative trauma disorders. Increasing the applied force increases muscle effort, decreases circulation to the muscles and causes greater muscle fatigue. Effort required to make a particular cut, either with a knife or scissors, can depend upon the sharpness of the tool. A dull instrument requires more force or exertion and contributes to cumulative trauma disorders.

Forceful gripping may cause pressure on nerves from muscles or tendons, as may repeated movement. Hand and arm motions may include grasping, turning, applying pressure and pinching. These movements frequently result in stressful hand and wrist positions. Compression or pressure to nerves (and blood vessels) can also occur when tool handles are squeezed in the palm.

Repetition

Repetition involves performing the same motion or series of motions repeatedly as well as frequently. Effects of repetitive motions from performing the same work activities increase when awkward postures and forceful exertions are involved. Repeated applications of force that do not cause immediate damage can, over time, induce fatigue in our connective tissues and wear them out resulting in the cumulative trauma mentioned earlier. The longer the period of continuous work, the longer the necessary recovery or rest time required.

The speed of work may be determined by the speed of a conveyor belt. For example, in poultry processing, the faster the conveyor line, the more frequent is the requirement for the cutting of chicken (the repetition of a specific task). Jobs that require frequent repetition of the task cause muscles to contract frequently, requiring more muscle effort and less recovery time.

Posture

There are postures that our joints can absorb more easily than others. The closer to the extreme of a joints range of movement, the less capable the joint is and the more susceptible to injury. An extreme posture can cause stress in the joints reducing the blood flow.

Body postures that deviate from normal resting or neutral positions place unnecessary stress on muscles, tendons and bones are referred to awkward. Awkward postures include reaching above shoulder height, kneeling, bending the head over to look in hard-to-see areas, improper cutting and twisting the body while lifting.

Awkward hand motions are sometimes used to separate meat from chicken bones.

One hand may hold meat while the other hand is holding the knife to make a specific cut.

Static postures are those held for a long period of time that can place stress on the body, particularly if the posture is awkward. Static postures can accelerate the development of fatigue and discomfort.

Vibration

The body experiences stress when using vibrating objects such as tools or while standing on a vibrating platform. Vibration can lead to reduced blood flow to the exposed body part causing stiffness and numbness in the affected area. Vibration is the physical exposure to tools or machinery that moves back and forth really fast. Standing on a vibrating platform can lead to digestive and back disorders.

Contact Stress

Contact stress occurs with physical contact between the body and sharp or blunt edges of tools, equipment and products. This is a dynamic force applied to the body, like when you use a hammer. The body responds to impact stress by limiting blood flow to the exposed body part.

In addition to the factors listed above other factors in poultry processing such as gloves and temperature are as important. Working with gloves that fit too tight restricts the blood flow to the fingers and cause numbness in the fingers; in addition, working with gloves that are too big limit dexterity and makes gripping more difficult. Gloves also increase the amount of force that a worker must exert in order to handle objects.

In order to meet USDA requirements, product must be kept at 40 degrees as it moves through processing. This requires the product to be washed and cooled with cold water causing discomfort to workers who may experience poor circulation or musculoskeletal disorders in the hands. Exposure to temperatures below 66 degrees F for more than two hours can limit blood flow to the extremities, which can cause numbness and in the hands and fingers and reduces grip strength. PPE, such as rubber aprons and gloves, are recommended for these types of work areas.

CHECK FOR UNDERSTANDING

Participants will identify and raise awareness of health and safety risks in the workplace by engaging in a body mapping activity. Body mapping involves workers identifying their own work-related injuries and illnesses by indicating (representing injuries, illnesses, and stresses) on a drawing of a body. Body mapping is a tool that can be used by employers and workers to identify any reoccurring injuries and helps to develop priorities for hazard prevention and correction.

Body mapping involves workers identifying their own work-related injuries and illnesses by placing indicators on a drawing of a body.

Give participants the [Body Mapping Activity Sheet](#) and ask them to remember specific and personal work-related injuries, illnesses and stresses from the past or present. Participants can work individually or in pairs to show on the body map parts of their body that have been affected.

Ergonomic factors can affect your body so you want to ensure protection.

When your body is under too much pressure or strain it will let you know. Effective treatment of pain and strain requires paying attention to early warning signs.

Some of the early warning signs include:

- Swelling
- Numbness
- Tingling
- Discomfort
- Burning sensations
- Irritation
- Insomnia
- Stiffness

You can experience these early warning signs in your back, neck, shoulder, elbows, forearms, wrists and hands. Using the debone work area as an example, these different body parts performing varied work functions can experience or be subjected to various ergonomic stress factors.

Back

There are several examples of back stressors. For instance, a person in the position of loader bends over repeatedly to remove product from a bin and is engaged in repetition causing stress on the back. Workers on the processing line cannot leave their station and after standing for long periods of time can experience static force.

Workers engaged in cutting and pulling meat from the bone have to do so at high rates

of speed. Failure to keep up can result in chasing product down the line taking the worker out of their own space. This twisting puts your body in an awkward position and can cause not only injury to you, but to others.

Preventative measures that can be used to take some of the added pressure off the back are wearing insoles, putting down an ergo mat, changing stance, shifting weight, and wearing proper footwear. In addition, engaging proper work practices (cutting and pulling techniques) pre-shift and periodic upper body/back/neck exercises, and keeping work tools (scissors and knives) sharp help a worker keep pace and avoid unnecessary twisting.

Neck and Shoulder

A person's stature is a consideration when working on the processing line. A person who is too tall often stoops over. The static force caused by bending over not only causes pressure on the back, but neck as well. Persons who are short tend to engage in improper reaching. The improper reaching takes a worker out of the normal body range and causes undue pressure on neck and shoulders. A worker in a position where what they do affects the person beside them, as in a poultry processing line, must be much focused, staying on task. This intense concentration can often result in a worker having their head bent over for extended periods of time.

Elbows

Workers who engage in what sometimes is referred to as the "lazy cut" are workers who attempt to make cuts while propping on their elbows. Not only is this an improper work practice, it puts pressure on the nerve in the elbow, leading to increase risk of injury, i.e., tennis elbow.

When handling and reaching for product the elbows should be kept close to the torso. Repetitive, elevated reaches when loading or lifting product causes stress to the elbow and should also be avoided.

Forearms, Wrists, and Hands

Different product (leg, thigh, breast, and wing) requires different cuts, some are cut right to left, others left to right. Using in-line knives can force a worker to bend their wrist in order to exert the force needed to control the knife. In addition, improper cutting methods and dull knives can place added pressure from undue force on the forearms, wrists and hands. Also, scissors can rub on the sides of fingers, causing pressure and compression to nerves of the fingers.

As previously noted, sharper knives reduce the force needed to make a cut. Good knife steeling equipment should be readily available for each worker required to use a knife. Bent handle knives to allow cuts to be made with straight wrists is another control.

In addition to the preventative measures mentioned above, warm-up exercises and stretch breaks can also help relieve pressure. Using the [excerpt](#) from *A Guide to Safe Work Practices in the Poultry Processing Industry* from the North Carolina Department of Labor Occupational Safety and Health Division, model some exercises that workers might try. Give participants an opportunity to demonstrate the exercise as well.

CHECK FOR UNDERSTANDING

In this activity, the facilitator/trainer will engage participants in a game of jeopardy.

Categories: Ergonomic Factors, Prevention, Warning Signs, Exercises, Work Practices

Question Bank:

1. A situation where employees work several different jobs to avoid stressing the same parts of the body.

What is job rotation? (Controls-1)

2. Reducing exposure to hazards by modifying the workplace policies and procedures.

What is an administrative control? (Controls-2)

3. Design, modify or replace workstations, equipment or tools.

What is an engineering control? (Controls-3)

4. Engineering, administrative and PPE

What are controls used to prevent MSD's? (Controls-4)

5. I help prevent feet from fatigue after long periods of standing on hard floors and surfaces.

What are insoles? Or What is proper footwear? (Controls-5)

6. This item protects hands from injury or cold.

What are gloves? (Prevention-1)

7. A tool used to identify reoccurring injuries.

What is body mapping? (Prevention-2)

8. Swelling, numbness, tingling, discomfort, burning sensations, irritation, insomnia, stiffness

What are early warning signs? (Prevention-3)

9. Stretching to relieve stress and pressure on body.

What is exercise? (Prevention-4)

10. Things you can do to avoid injuries or illnesses.

What are preventative measures? (Prevention-5)

11. Force, posture, repetition and contact stress.

What are ergonomic stressors or factors? (Stressors-1)

12. Performing the same motion or series of motions repeatedly and frequently.

What is repetition? (Stressors-2)

13. Tasks that require exertions and result in pressure on joints

What is force? (Stressors-3)

14. Positions that place stress on the body, such as reaching above shoulder height, kneeling, squatting, leaning over a worktable, twisting the torso while lifting

What is posture? (Stressors-4)

15. Injuries caused by exposure to repetitive, forceful or awkward tasks over time.

What is cumulative trauma? (Stressors-5)

16. The study of how to bring the work to the worker.

What is ergonomics? (Ergonomics-1)

17. MSD's

What are musculoskeletal disorders? (Ergonomics-2)

18. Poor work design and practice.

What is the cause of MSD's? (Ergonomics-3)

19. Injuries, absenteeism, high turnover, reduction in quality, and increase in costs

What are the results of neglecting ergonomics? (Ergonomics-4)

20. The proper design of tools, equipment, workstations, and job tasks.

What is ergonomics? (Ergonomics-5)

You can develop your own set of questions for a new game or add to this list. To create a more meaningful learning experience, you may engage participants in some discussions following each question.

CONTROLS	PREVENTION	STRESSORS	ERGONOMICS
\$100	\$100	\$100	\$100
\$200	\$200	\$200	\$200
\$300	\$300	\$300	\$300
\$400	\$400	\$400	\$400
\$500	\$500	\$500	\$500

EXAMPLE OF GAME BOARD

Resources

Hogan Assessment Systems, The Meta-Analytic Correlation between the Big Five Personality constructs of Emotional Stability and Conscientiousness

North Carolina Department of Labor Occupational Safety and Health Division, A Guide to Safe Work Practices in the Poultry Processing Industry

Poultry Processing Industry eTool (<http://www.osha.gov/SLTC/etools/poultry/>)

<http://www.oshainfo.gatech.edu/ergo-training/trainer.html>

United Food and Commercial Workers International Union, A Safety Committee Guide for the Workplace, www.ufcw.org.

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