

Ergonomic Job Analysis

1. Basic Job Documentation

Job Name/Title: Round Dropper

Date: November 16, 2004

Work Objectives: To separate the round (thigh primal muscle group) from the femur bone during the fabrication of boxed beef. This must be accomplished while the hind-quarter is suspended from a moving overhead conveyor.

Job Analyst: Jim Stewart

Worker:

Name: Ignacio Reyes

Height: 67 inches

Hand Dominance: Right

Experience: 8 months on job

Number of Other

Workers on this Job: nine (5 on each of 2 shifts)

Work Schedule:

Shift Start: 7:00 a.m. **End Time:** 15:45 p.m.

Break Schedule: 9:15 a.m. (15 min. break) 11:30 a.m. (30 min. lunch)

Total Work Time: 7 hours, 45 minutes (non-continuous)

Production Information: Conveyor speed averages 325 head (650 rounds) per hour.

Normal crewing for this line is five round droppers pulling full count. Cycle time is 1 min., 17 sec. (48 sec. for tasks, 29 sec

recovery to reposition at beginning of line for product pickup).

Job Rotation Plan: None

Work Station Sketch: See attached CAD plot

Equipment: None

Tools: Six inch superflex boning knife, meat hook

Handled Product: Rounds

Environment: Cold (29-34 degrees Fahrenheit)

Personal Protective

Equipment: Stainless steel chest, back and arm mesh; stainless steel hook hand glove; cut resistant knife hand glove; helmet, safety glasses; ear plugs; steel-toe boots.

Work Methods: Worker approaches hind-quarter on moving overhead conveyor at upstream position on line. Worker places meathook with non-dominant hand and makes initial mark with knife to separate eye from tibia. Worker then repositions hook lower on round and pulls down while following intermuscle seam with knife. Worker again repositions hook and continues removing muscle until it is suspended from femur. Worker then rotates upstream of line to pick up next product.

2. Identify and Evaluate Generic Risk Factors

Repeated and Sustained Exertions:

Upper Extremity: Hand (hook): extremely tight grasp to maintain grip during pulls;
Hand (knife): tight grasp to maintain control of knife
Arm/Shoulder (hook): extreme pulls, sometimes exceeding 100lbs
of force (peak), sustained @ 30-60 lbs (continuous)
Back: strain due to downward pull on product

Whole Body: Body used as counterweight during downward pull on product

Pace Rating: Medium

Posture: Poor towards end of job as worker is stooped while exerting
downward pressure. Poor at beginning as arm is abducted. Fair at
middle of task.

Forceful Exertions:

Upper Extremity: Yes, pulling forces can reach 100 lbs (peak), 30-60 lbs (static)

Whole Body: Yes, pulling forces can reach 100 lbs (peak), 30-60 lbs (static)

Awkward Posture:

Upper Extremity: Hand (hook): hyperflexion and hyperextension

Hand (knife): Ulnar and radial deviation

Arm/Shoulder (Hook): abduction

Back: Stooped at end of cycle

Whole Body: Twisting at trunk, stoop/bending at waist to manipulate product downward

Mechanical Stresses

(Local Contact):

Hand (hook): palmar side of hand and fingers

Fingers (hook): interphalangeal, between index and middle fingers or between middle and ring fingers depending upon type of hook

Hand (knife): palmar side of hand and fingers

Vibration: None

Temperature Extremes: Cold (28-34 degrees Fahrenheit)

Overall Summary: This job was cited by OSHA as having ergonomic stresses associated with it that constituted a serious risk to the employee. This job as experienced 2 reportable CTDs in the first 9 months of 1995. Modifications were made to this line's overhead conveyor in August, 1995 as per OSHA recommendation to lower it 12 inches, allowing the employee to begin the initial knife mark and hook positioning at or below shoulder level. The overhead conveyor returns to original height after a run of 22 feet. The employee can now pick up the product when it is presented to him at the desired height. Further modifications may be necessary at the end of the line to raise the overhead conveyor above present height to eliminate the stoop/bend at the waist (see attached Job Hazard Analysis).

3. Recommended

Solutions: Further modify the overhead conveyor at the end of the line so the final tasks in the job can be accomplished without the worker stooping/bending at the waist.

Develop a mechanical assist to pull the product down at the necessary force level to eliminate the worker using his body as a counterweight. This would eliminate static and peak forces that are transmitted to the worker's hand, wrist, arm and shoulder (non-dominant side).

Utilize air/gas injection into muscle seams to break fascia, thereby reducing forces required to complete job by up to 50 percent.

Explore possibility of mechanically making initial knife mark at top of round in order to eliminate that task from the job.

Utilize job rotation to rotate workers to another job that does not have the

level of ergonomic/musculoskeletal stress to specific body parts.

REQUIRED PERSONAL PROTECTIVE EQUIPMENT :

HARD HAT, EYE PROTECTION, EAR PLUGS, STEEL TOED BOOTS, GAITORS, HAIRNET	MESH GLOVE / (spl
<i>SEQUENCE OF BASIC JOB STEPS</i>	<i>POTENTIAL AC</i>
ROTATE ROUND ON CHAIN SO KNUCKLE FACES OPERATOR	CONTUSION
MARK INSIDE ROUND SEAM MAKING SURE OF GOOD SEPARATION	LACERATION
HOOK KNUCKLE JOINT AND MARK PATELLA AT @ 45 DEGREE ANGLE	PUNCTURE
WHILE PULLING, FOLLOW SEAM OF BOTTOM ROUND TO BASE OF FEMUR, PICKING UP THE FELT IN FRONT	
WALK BACK TO NEXT PIECE	
	HEAVY FOOT TRAFFIC
	HEAVY LIFT TRUCK TRA

1. Select an experienced employee to observe.
2. Observe carefully to get the step breakdown.

3. Check the step breakdown with the employee.
4. Record the step breakdown.
5. Observe for specific types of injuries / illnesses.

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<i>SEQUENCE OF BASIC JOB STEPS</i>	<i>POTENTIAL ACCIDENTS</i>	
THUMB-SWITCH		PLAC
COUNTER-BALANCE SUSPENSION		DIRE
	PUNCTURE	NEVE
		KEEP
	LOOSE AIR HOSE	IMME
HOOK PATELLA BONE		KEE
ACTIVATE RAM	CONTUSION	PRE
UNHOOK	LACERATION	CLE
WAIT FOR NEXT PIECE	PUNCTURE	STA
	SLIPS	

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SEQUENCE OF BASIC JOB STEPS	
POSITION SO THAT KNUCKLE IS FACING OPERATOR	CON
INSERT HOOK INTO PATELLA BONE FOLLOW CONTOUR OF BONE WITH KNIFE TO REMOVE ASIDE BONE TO BONE BELT	LACE
INSERT HOOK INTO KNUCKLE AND CUT ANY REMAINING ATTACHMENT AT BOTTOM OF KNUCKLE	PUN
HOOK KNUCKLE AND FOLLOW AROUND KNUCKLE WITH KNIFE TO REMOVE PEELED KNUCKLE LEAVING SKIN ON THE ROUND	
DROP KNUCKLE TO STRIP LINE CONVEYOR	
NOTE: ON REGULAR KNUCKLE, ELIMINATE THE SKINNING PROCESS	
WALK BACK TO NEXT PIECE	SLIP

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