Ergonomics & Injury Prevention - A Comprehensive Approach

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Cargill Protein Group
Ergonomics Definition

Ergonomics = optimization

Injury Prevention

System performance
The Human Equation

Ergonomics = Injury Prevention + System Performance

Injury Prevention = Ergonomics?
Board of Certification in Professional Ergonomics:

CORE COMPETENCY OF A PROFESSIONAL ERGONOMIST

- ANALYSIS – discover, gather data
- DESIGN – develop systems
- VALIDATION – testing, evaluation
- IMPLEMENTATION – training, education, communication

Ergo Professionals (as of 9/16):
CPE -- 727
Ergonomics in the Workplace

HR

Medical & Therapy

Human-Physical

Safety

Engineering-Design

Human-Cognitive

Human Factors

Maintenance
Ergonomics and Injury Prevention

How do we bring these concepts and groups together for achieve reductions in MSD risk and injuries?
How to achieve Ergonomic Goals?

CPS Ergonomics Program

- Integrate ergonomics into business model
- Use methodical approach based on scientific research
- Provide standardized framework
The Ergonomics Maturity Curve™

Created by Humantech Inc.
Ergonomics & Musculoskeletal Disorders

How do we help a person be successful when they are an employee of this company?

Success = Productive + Safe
Ergonomics & Musculoskeletal Disorders
Preventive
EHS, HR, Medical, Supervisors

Job Matching Process

Work Practice Training/ Ramp-in

Conditioning Program

Prioritizing based on physical demands
MSD Risks Addressed at Preventive Level

FACTORS THAT DRIVE THE NEED FOR THESE PROCESSES

• Turnover Rate
  • A high turnover results in high volume of new hires

• Physical Demands
  • High demand environments will place higher stresses on new hires
  • Need to plan for development of employees capabilities to meet demands

• Injury Trends
  • Elevated rates of injury in first 12 months of employment indicates gaps in processes

• Workers Compensation
  • Elevated Work Comp costs related to injuries in first 12 months of employment
Preventive Ergonomics

- Post-Offer Pre-Work Screens
- Job Task Procedures
- Physical Demands Descriptions
- Currently being piloted in single facility
Preventive Ergonomics

Work Practice Training – Job Task Procedures
- Standardized template and process for developing procedures as an effective training tool

**TASK PROCEDURE**

1. Grab an empty box by the handle from the box conveyor and place the empty box on the rollers.
2. Reach forward approximately 36" for a label and places it on the box.
3. Grab the product and pull it off the conveyor. Type of product depends on what station you are located at. Place the product in its appropriate box.
4. At stations 4, 6 and 7 you must weigh a product. In this case, you take the meat off the belt, turn and place it on the scale located behind you. Once weighed, place the meat in its appropriate box.
5. Combos are located at stations 1, 2 and 4. You must turn and toss specific types of meat into the large combo boxes located behind you. Once the combo boxes are filled another employee removes them with a pump truck. You still have to fill regular boxes while filling the combos.
6. At station 11 (only during Japan products), and station 12 you have to push or toss some of the meat onto the shelf located on the other side of the conveyor. All other stations only work when too much product comes down the belt.
7. Once the box is filled use your knee or hands to push the box onto the bottom conveyor.

![Lifting Do's & Don'ts](image_url)
## Preventive Ergonomics

### RAMP-IN

<table>
<thead>
<tr>
<th>Scores</th>
<th>PDD Rating</th>
<th>Skills/ RTW Criteria</th>
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<tbody>
<tr>
<td>1</td>
<td>low = 0-100</td>
<td>Employee has or exceeds all the skills required for the job</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RTW to same job- away for two weeks or longer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Job requires low skill level; employee has some skills</td>
</tr>
<tr>
<td>2</td>
<td>low/med = 101-200</td>
<td>Job requires moderate skill level; employee has some skills/ experience</td>
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<tr>
<td></td>
<td>medium = 201-300</td>
<td>Job requires low skill level; employee has minimal/ no skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RTW to different job- away for two weeks or longer</td>
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<tr>
<td>3</td>
<td>med-high = 301-400</td>
<td>Job requires moderate skill level; employee has minimal to no skills</td>
</tr>
<tr>
<td></td>
<td>high = 401-500</td>
<td>Job requires high skill level; employee has some to no skills</td>
</tr>
</tbody>
</table>

**Selected score:**

- **3**
- **2**
- **5**
Preventive Ergonomics

Conditioning Programs
- Stretching
- Body conditioning/strengthening

Flexion
- When strengthening your wrist, use smaller weights.
- Do 3 sets of 10-15 repetitions.
- Always remember to strengthen both hands.

Extension

Radial Deviation
REACTIVE
EHS, HR, Medical, Supervisors

- Incident Investigations
- Countermeasure process
- Management review incidents
- Case Management
- Injury data collection/ tracking
MSD Risks Addressed at Reactive Level

FACTORS THAT DRIVE THE NEED FOR THESE PROCESSES

• Injury Trends
  • Elevated number of ergonomics related incidents
  • Repeated incidents for same job/task or employee

• Incident Investigations
  • Limited engineering-based controls recommended
  • Administrative controls used heavily
  • Blame the employee
Incident Investigation: Material Handling
Root Causes: Linear Thinking

Problem: Employee experienced discomfort while lifting heavy tote

Body Part: Low Back

Ergo Stressors: Twisting, Repetition

Workplace Evidence: Working Too Fast, Improper Technique, Working Too Fast, Lack of Rotation with CoWorker

Solution: Slow Down, Don’t Twist, Slow Down, Rotate When Tired
Root Causes: ErgoThinking

Problem: Employee experienced discomfort while lifting heavy tote
Body Part: Low Back
Ergo Stressors:
- Twisting
- Repetition
- Lifting Heavy Load
- Bending / Stooping

Workplace Evidence:
- Workstation & Equipment Layout
- Body Mechanics / Technique
- Producing Pallets Quicker than Needed
- Lack of Rotation with CoWorker
- Use of Tote
- Origin/Dest of Lifts

Why?
- Process Flow and Layout Not Optimal
- Working too Quickly within Layout
- No Defined Work/Rest Schedule
- No Established Rotation Schedule
- No Defined Load Size
- Alternative method for freezing
- Pallet on Floor
- Pallet Stacked to Set Height
**PROACTIVE**

EHS, Ops, CI

- Continuous Improvement mindset
- Risk management approach
- Process optimization & design
- Team approach with SMEs

**ADVANCED**

Engineering/ Design/ Capital

- Prioritization
- Hazard Identification & Analysis
- Hazard Controls
MSD Risks Addressed at Proactive Level

FACTORS THAT DRIVE THE NEED FOR THESE PROCESSES

• Data-driven decisions
  • Selection of jobs/tasks that drive down injuries in a facility
  • Combination of ergonomics and business based criteria
• Risk-based decisions
  • Quantitative analysis of ergonomics risk factors
  • Improved root cause analysis and solution development
• Measurable impact of solutions
  • Ability to predict impact versus hope for impact
ATLAS ERGONOMICS SOFTWARE

Risk Analysis
- Pinpoint body parts/hazards of greatest concern & calculate level of risk

Solution Tracking
- Track & prioritize all solution options

Before/After Results
- Track & store before/after results

Share across businesses
- Share across businesses

Share/compare across all sites
Proactive Ergonomics

USING RISK ANALYSIS TO MAKE DECISIONS THAT WILL KEEP OUR EMPLOYEES SAFE

A. Neck, Trunk and Leg Analysis

1. Neck Position
   - Neck Score
   - If neck is twisted or side bending: +1

2. Trunk Position
   - Trunk Score
   - If trunk is twisted or side bending: +1

3. Leg Position
   - Leg Score
   - If leg is twisted or side bending: +1

Table A

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<thead>
<tr>
<th>Neck</th>
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<th>3</th>
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<td>5</td>
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<td>6</td>
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Palletizing Solution Selection

Primary purpose is to reduce or eliminate any Ergonomic hazard that employees are exposed to while palletizing

Elimination

- Bending down to pick up spacers
- Bending down every time they start a new pallet
- Constant bending
Palletizing – Evaluate Options

How many lifts per minute?

<table>
<thead>
<tr>
<th>Lift Frequency</th>
<th>1 hr or less</th>
<th>1 hr to 2 hrs</th>
<th>2 hrs or more</th>
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<td>1 lift every 2-5 mins.</td>
<td>1.0</td>
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<tr>
<td>1 lift every min</td>
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<td>0.75</td>
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<tr>
<td>2-3 lifts every min</td>
<td>0.9</td>
<td>0.85</td>
<td>0.65</td>
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<tr>
<td>4-5 lifts every min</td>
<td>0.85</td>
<td>0.7</td>
<td>0.45</td>
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<tr>
<td>6-7 lifts every min</td>
<td>0.75</td>
<td>0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>8-9 lifts every min</td>
<td>0.6</td>
<td>0.35</td>
<td>0.15</td>
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<tr>
<td>10+ lifts every min</td>
<td>0.3</td>
<td>0.2</td>
<td>0.0</td>
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*Every number is multiplied by .85 due to excessive twisting >45
PROACTIVE
EHS, Ops, CI

Continuous Improvement mindset
Hazard Identification & Analysis
Hazard Control
Engages many (Teams)

Understand Current State
- Gather historic concerns

Engage Advanced Engineering
- Ergonomic Design Standards

Engage Product Design
- Design for Ergonomics in Assembly
- Gate reviews for product, process, equipment

ADVANCED
Engineering/ Design/ Capital
MSD Risks Addressed at Advanced Level

FACTORS THAT DRIVE THE NEED FOR THESE PROCESSES

• Capital Projects
  • New projects that will have a significant impact on employees and processes in facility
• Large number of changes
  • Projects that occur in rapid fashion and/or on regular basis
• Engineers and Project Managers need SME input
  • Timelines for projects are critical and information must be readily available to ensure ergonomics is considered
Proactive Ergonomics

MOC Process

WHERE RISK CAN BE FOUND AND ELIMINATED – BEFORE THE PROJECT HITS THE FLOOR

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<th>Safety:</th>
<th>Name:</th>
<th>Signature:</th>
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<td>E-stop considerations</td>
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<td>Lockout (elect/press/gravity/chem.)</td>
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<td>PPE</td>
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<td>Machine Guarding</td>
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<td>Confined Space</td>
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<td>Fall Protection (anchor points)</td>
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<td>Working Platform (Guard Rails)</td>
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<tr>
<td>Conveyor Height</td>
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<tr>
<td>Work Station Height</td>
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<td>Employee work motion change</td>
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<td>Other Ergo Considerations</td>
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Advanced Ergonomics

- Vertical reach zones

![Image of workers in a lab setting with a chart of forward reach zones.](image-url)

<table>
<thead>
<tr>
<th>Forward Reach</th>
<th>cm</th>
<th>25</th>
<th>50</th>
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<tr>
<td>in.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>75</td>
<td>70</td>
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<tr>
<td>20</td>
<td>84</td>
<td>80</td>
<td>79</td>
<td>75</td>
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</tbody>
</table>

- Centerline, 15 – 30 cm (6 – 12 in.) to right
- 46 cm (30 in.) to right of centerline
- 61 cm (24 in.) to right of centerline
- 76 cm (30 in.) to right of centerline

Height above floor
Advanced Ergonomics

MODELING OUR DESIGNS TO PREDICT RISK

20°

29 5/16" REACH TO PULL SEALS BACK
Ergonomics and Injury Prevention

Corporate Ergonomics Program
CPG

Ergonomics Program Elements

- Ergonomics Program
- Program Management
- Injury Statistics
- Prioritization
- Job Task Documentation
- Physical Demands Description
- Hazard Identification & Analysis
- Hazard Controls
- Medical Management
- Office Ergonomics
- Training & Education
- Program Evaluation

Preventive and Reactive

Advanced and Proactive
Our progress to date...