

CASE STUDY – Cooking (Food Preparation)

TASK TITLE: Cooking (Food Preparation)

Task Description:	<p>The Cooking (Food Preparation) task involves all aspects of the preparation of foods. This includes moving boxes and bins of ingredients, cutting ingredients into pieces, as well as moving pans to and from the ovens. Short order grill cooking and preparing baked goods are addressed in the Cooking (Short Order Grill) and Baking case studies, respectively.</p> <p>Typical environments in which the Cooking (Food Preparation) tasks can occur include (but are not limited to) are:</p> <ul style="list-style-type: none">• Cafeterias and mess halls• Restaurants• Clubs
Job Performance Measures Most Often Impacted by Cooking: (Food Preparation)	<p>Measure of work performance can include (but are not necessarily limited to):</p> <ul style="list-style-type: none">• Hours daily to complete Cooking (Food Preparation) tasks• Taste of food
Typical Employee Comments about Cooking: (Food Preparation)	<p>Employees typically experience discomfort in the legs/feet and lower back.</p> <p>The back/torso is the body area that most commonly receives a “High” priority rating. The remaining body areas, with the exception of the head/eyes, are more likely to receive a “Medium” priority rating, or lower.</p>
Suggested Level II Analysis:	Dynamic Task Analysis, Biomechanical Lifting Analysis

Shoulder/Neck

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
1. Reaching	<ul style="list-style-type: none"> Work area too high  <ul style="list-style-type: none"> Items stored too high 	32. Lower the work piece/work surface <ul style="list-style-type: none"> position ingredient prep work near or just above elbow level use an adjustable height table provide height adjustable mixing bowls provide several alternate work height prep tables 	✓		low	med	med
		123. Raise the person <ul style="list-style-type: none"> provide a portable work platform which can be easily stored under the table, out of the way 		✓	med to high	low	low
		123. Raise the person <ul style="list-style-type: none"> provide a footstool or small step 	✓		low	low	low
		32. Lower the work piece/work surface <ul style="list-style-type: none"> place frequently accessed and/or heavy ingredients on shelves between mid-thigh and chest height 	✓		low	low	med
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> avoid stacking pans above shoulder height in cart racks 	✓		low	low	low
		<ul style="list-style-type: none"> place frequently accessed and/or heavy ingredients on shelves between mid-thigh and chest height 	✓		low	low	low

Shoulder/Neck (Cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> • Work too far away 	41. Move work piece closer to body <ul style="list-style-type: none"> • place frequently used items with easy reach • modify storage containers to reduce reach requirements • provide dispensing mechanisms for ingredients 	✓		low	low	low
				✓	med	med	med
				✓	med to high	med	med
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> • slide the work closer before lifting • use front stove burners for foods requiring considerable attention during cooking 	✓		low	med	low
			✓		low	med	low
	<ul style="list-style-type: none"> • Reaching into oven to place/remove items in back 	148. Provide appropriate equipment <ul style="list-style-type: none"> • install an oven with a vertical or horizontal rotisserie/carousel in order to minimize reaching and bending 		✓	high	low	med

Shoulder/Neck (Cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
2. Arm forces: Repeated arm forces or holding/carrying materials	<ul style="list-style-type: none"> Carrying stacks of pans and ingredient cases more than three steps Rolling/sliding resistance of cart or piece of equipment causes high forces 	48. Provide a cart <ul style="list-style-type: none"> use existing carts provide sufficient number of carts to insure availability 	✓	✓	low med	low low	low med
		4. Change a lifting/carrying task to a rolling or sliding tasks <ul style="list-style-type: none"> provide carts which can be adjusted to bench, shelf and oven heights to minimize lifting 		✓	med	med	high
		126. Reduce carry distance <ul style="list-style-type: none"> arrange storage and work areas to reduce travel distances 	✓		low	med	high
		11. Eliminate unnecessary tasks <ul style="list-style-type: none"> eliminate or combine handling tasks transport items in larger quantities instead of handling them individually 	✓		low to high low to high	med med	high high
		19. Improve wheel condition <ul style="list-style-type: none"> repair wheels on carts or equipment 	✓		med	high	high
		119. Provide wheels <ul style="list-style-type: none"> install appropriate wheels; select larger wheels for the tile floors. 	✓		med	high	high

Shoulder/Neck (Cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> Floor/surface condition causes high forces during a rolling or sliding task Reaching into oven to place/remove items in back Freezer door is difficult to open 	<p>17. Improve floor condition</p> <ul style="list-style-type: none"> improve housekeeping repair cracks or gaps in floor provide ramps to compensate for minor differences in floor height <p>148. Provide appropriate equipment</p> <ul style="list-style-type: none"> install an oven with a vertical or horizontal rotisserie/carousel in order to minimize reaching and bending <p>35. Maintain tracks, rollers, and movement mechanisms</p> <ul style="list-style-type: none"> perform routine lubrication and maintenance on the freezer door to limit force requirements lubricate door hinges <p>11. Eliminate unnecessary tasks</p> <ul style="list-style-type: none"> replace freezer door with an air curtain 	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>low</p> <p>high</p> <p>med</p> <p>high</p> <p>med</p> <p>low</p> <p>high</p>	<p>med</p> <p>med</p> <p>med</p> <p>low</p> <p>low</p> <p>low</p> <p>low</p>	<p>med</p> <p>med</p> <p>med</p> <p>med</p> <p>med</p> <p>med</p> <p>med</p>

Shoulder/Neck (Cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
3. High speed, sudden shoulder movements	<ul style="list-style-type: none"> Speed of lift Freezer door is difficult to open 	13. Encourage ergonomic work techniques <ul style="list-style-type: none"> encourage person to use smooth fluid movements while handling items 	✓		low		low
		147. Provide alternate container <ul style="list-style-type: none"> contact vendor to request addition of handles or repackaging of contents to increase density 		✓	med	med	med
		35. Maintain tracks, rollers, and movement mechanisms <ul style="list-style-type: none"> perform routine lubrication and maintenance on the freezer door to limit force requirements lubricate door hinges 	✓		med	low	med
		11. Eliminate unnecessary tasks <ul style="list-style-type: none"> replace freezer door with an air curtain 	✓		low	low	med

Shoulder/Neck (Cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
4. Head/neck bent or twisted	<ul style="list-style-type: none"> Location of work too low 	20. Incorporate rest pauses 124. Raise the work piece/work surface <ul style="list-style-type: none"> provide a riser or block to raise work surface 	✓		low	low	med
			✓		low	high	high

Hands/Wrists/Arms

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On		
			✓ Minor Modification	✓ Major Change		Quality	Productivity	
5. Bent wrists/repeated wrist movements or repeated forearm rotation	<ul style="list-style-type: none"> Cutting ingredients with knife  <ul style="list-style-type: none"> Repeated movements from stirring or scraping kettles clean 	149. Provide appropriate tools <ul style="list-style-type: none"> a bent handle knife can be appropriate for many slicing and chopping tasks use a food processor to chop ingredients 		✓ ✓	med med	low low	low med	
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> use cooking sprays during cooking soak kettles immediately after use 	✓ ✓	low low	low low	med med		
		148. Provide appropriate equipment <ul style="list-style-type: none"> provide kettles and other cooking equipment that have non-stick surfaces provide automatic stirring elements or powered mixers for mixing tasks 		✓ ✓	med med	low low	med med	

Hands/Wrists/Arms (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
6. Repeated manipulations with fingers	<ul style="list-style-type: none"> Hand manipulating ingredients 	149. Provide appropriate tools <ul style="list-style-type: none"> use powered food mixers for as many tasks as possible 	✓		med	low	med
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> encourage personnel to minimize awkward wrist postures 	✓		low	low	low
7. Hyper-extension of finger/thumb or repeated single finger activation	<ul style="list-style-type: none"> Rarely occurs 						
8. Hand/grip forces	<ul style="list-style-type: none"> Fingertip forces used to pry apart pans that are stuck together 	128. Reduce force required to install or remove component <ul style="list-style-type: none"> use a small wedge to separate pans 	✓		low	low	med
		<ul style="list-style-type: none"> a spoon or small pry bar can be used to perform the prying task 	✓		low	low	med

Hands/Wrists/Arms (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> • Holding pans with a pinch grip 	3. Change a pinch grip to a power grip <ul style="list-style-type: none"> • use a full hand grip on pans when possible 	✓		low	low	low
	<ul style="list-style-type: none"> • Holding pans back too far on the handle 	13. Encourage ergonomic work techniques <ul style="list-style-type: none"> • choke up on handle to improve control of pan 	✓		low	low	low
		94. Provide appropriate handles <ul style="list-style-type: none"> • provide handles that are insulated to prevent contact with hot surfaces. 		✓	med	med	med
	<ul style="list-style-type: none"> • Hand manipulating ingredients 	149. Provide appropriate tools <ul style="list-style-type: none"> • use powered food mixers for as many tasks as possible 	✓		med	low	med
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> • encourage personnel to minimize awkward wrist postures 	✓		low	low	low

Hands/Wrists/Arms (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
9. High speed hand/wrist/arm movements or vibration, impact or torque to the hand	<ul style="list-style-type: none"> Tearing open ingredient boxes and bags 	13. Encourage ergonomic work techniques <ul style="list-style-type: none"> use a knife to open boxes and bags 	✓		low	med	med
		149. Provide appropriate tools <ul style="list-style-type: none"> provide a utility razor to open boxes and bags 	✓		low	med	med
10. Exposure to hard edges	<ul style="list-style-type: none"> Hard edges on trays, pans and utensils 	93. Provide appropriate gloves	✓		med	low	low
		9. Eliminate exposure to hard edges <ul style="list-style-type: none"> use pot holders to avoid exposure to hard edges 	✓		low	low	low
11. Hands and fingers exposed to cold temperatures	<ul style="list-style-type: none"> Working in freezers, working with cold ingredients 	93. Provide appropriate gloves <ul style="list-style-type: none"> provide insulated gloves covered by an outer layer of plastic 		✓	med	low	low

Back/Torso

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
12. Repeated forward or sideways bending movements	<ul style="list-style-type: none"> Oven heights, stove heights and storage heights too low  <ul style="list-style-type: none"> Stacking items on low shelves of cart causes awkward bending 	4. Change a lifting/carrying task into a rolling or sliding tasks <ul style="list-style-type: none"> provide adjustable height carts which can adjust to bench, shelf and oven heights to minimize lifting 		✓	med	med	med
		13. Encourage ergonomic work technique <ul style="list-style-type: none"> use oven rack heights between mid-thigh and mid-chest height whenever possible 	✓	low	low	low	
		124. Raise the work piece work/surface <ul style="list-style-type: none"> place frequently accessed and/or heavy ingredients on shelves between mid-thigh and chest height 	✓	low	low	low	
		13. Encourage ergonomic work technique <ul style="list-style-type: none"> place frequently accessed and/or heavy ingredients on shelves between mid-thigh and chest height 	✓	low	low	low	

Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> Stacking items on low shelves of cart causes awkward bending Person tends to use the back to lift instead of using the legs to assist in the lift. Check for contributing factors in the workplace 	48. Provide a cart <ul style="list-style-type: none"> provide a cart that has spring loaded shelves (e.g., dish cart) or use a cart which has the bottom shelf removed 	✓		med	med	med
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> provide training on ergonomics principles and lifting techniques encourage person to use leg muscles to lift 	✓		med	med	med
	<ul style="list-style-type: none"> Reaching into oven to place/remove items in back 	148. Provide appropriate equipment <ul style="list-style-type: none"> install an oven with a vertical or horizontal rotisserie/carousel in order to minimize reaching and bending 	✓		med	med	med
				✓	high	low	med

Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
13. Twisting of the lower back	<ul style="list-style-type: none"> • Work area layout • Person tends to twist with the back instead of using the legs and feet to pivot 	130. Reduce the angle a person has to turn to transfer an item					
		<ul style="list-style-type: none"> • for example, if the transfer involves a 180 degree twist, move the source or destination to reduce the twist to 90 degrees or less 	✓		low to high	low	med
		<ul style="list-style-type: none"> • reposition supplies/materials to reduce twisting 	✓		low to high	low	med
		13. Encourage ergonomic work techniques					
		<ul style="list-style-type: none"> • provide training on ergonomics principles and lifting techniques 	✓		low	low	low
		<ul style="list-style-type: none"> • encourage person to use legs to pivot when handling a load 	✓		low	low	low

Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
14. High speed, sudden movements or Lifting awkward, uneven, shifting or bulky items.	<ul style="list-style-type: none"> Person tends to lift with a jerky motion instead of a smooth motion 	147. Provide alternate container <ul style="list-style-type: none"> contact vendor to request addition of handles or repackaging of contents to increase density 		✓	med	med	med
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> encourage person to use smooth fluid movements while handling items 	✓	low	low	low	
15. Static, awkward back postures	<ul style="list-style-type: none"> Ingredient prep area too low 	83. Provide an adjustable height lift table <ul style="list-style-type: none"> position ingredient prep work near or just above elbow level provide adjustable height table for ingredient preparation provide several alternate work heights 	✓	✓	low to med	med	med
				✓	high	med	med
				✓	med	med	med
16. Lifting forces	<ul style="list-style-type: none"> Lifting full pans from the oven. Lifting ingredients from shelves. 	4. Change a lifting/carrying task into a rolling or sliding task <ul style="list-style-type: none"> provide adjustable height carts which adjust to bench, shelf and oven heights to minimize lifting 		✓	med	med	med
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> encourage person to keep load as close to body as possible 	✓	low	med	med	

Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
17. Pushing or pulling	<ul style="list-style-type: none"> Rolling/sliding resistance of cart or piece of equipment causes high forces Floor/surface condition causes high forces during a rolling or sliding task Freezer door is difficult to open 	19. Improve wheel condition <ul style="list-style-type: none"> repair wheels on carts or equipment 		✓	med	med	med
		119. Provide wheels <ul style="list-style-type: none"> provide wheels with appropriate bearings and tread composition 		✓	med	med	med
		17. Improve floor condition <ul style="list-style-type: none"> improve housekeeping repair cracks or gaps in floor provide ramps to compensate for minor differences in floor height 	✓ ✓		low high med	high med med	high med med
		35. Maintain tracks, rollers, and movement mechanisms <ul style="list-style-type: none"> perform routine lubrication and maintenance on the freezer door to limit force requirements lubricate door hinges 	✓		med	low	med
		11. Eliminate unnecessary tasks <ul style="list-style-type: none"> replace freezer door with an air curtain 	✓	✓	low	low	med

Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
18. Whole body vibration	<ul style="list-style-type: none"> Rarely occurs 	N/A					
19. Fixed position, standing	<ul style="list-style-type: none"> Prolonged standing 	52. Provide a footrail or footrest		✓	low to med	low	med

Legs/Feet

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
20. Exposure to hard edges on legs, knees, and feet <u>or</u> Standing on hard surfaces	<ul style="list-style-type: none"> Standing on a hard surface 	86. Provide an appropriate anti-fatigue mat		✓	med	low	med
		96. Provide appropriate shoe inserts	✓		low	low	med
21. Awkward leg postures	<ul style="list-style-type: none"> Rarely occurs 	N/A					
22. Awkward foot postures	<ul style="list-style-type: none"> Rarely occurs 	N/A					

Head/Eyes

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
23. Difficult to see/light levels too low/too high	<ul style="list-style-type: none"> Rarely occurs 	18. Improve visual access to work <ul style="list-style-type: none"> Light levels should be 50fc to 100fc for work 		✓	low to high	med	med
24. Intensive visual tasks, staring at work objects for long periods	<ul style="list-style-type: none"> Rarely occurs 	N/A					

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