

## **Development of the USDA/Agricultural Research Service Job Hazard Analysis (JHA) Template** Megan Kennedy, Hao Tran & Charles Onwulata

### Introduction

After some serious accidents, the Agricultural Research Service (ARS) leadership realized that adequate hazard assessment was not being performed for various research activities.

To help prevent accidents and injuries a work group was tasked with creating a job hazard analysis (JHA) template to evaluate hazards in various jobs, including office work, lab work and fieldwork.

## What is a JHA?

A JHA is a tool for assessing the hazards associated with each step of a task and then determining what controls are needed to mitigate the hazards for each step.

Other terms for a JHA: work hazard assessment (WHA), job safety analysis (JSA) & task safety analysis (TSA)

## How to Create a Versatile JHA Template

- 1. Assemble a multi-disciplinary work group
- 2. Look at many different versions of JHAs (or similar)
- 3. Work group testing
- 4. Pilot testing at different locations with varying job tasks

## **Multi-Disciplinary Work Group**

- 1. Safety specialists
- 2. Research scientists
- 3. Technicians

- 4. Administrative support staff
- 5. Leadership staff

### **Final Products**

#### JHA Template

Task description Hazardous materials Special requirements Space for pictures Expandable format Contact information & signatures

#### **JHA Template Instructions**

Breaks down each section of the template and provides examples of hazards and mitigation controls

#### **Introductory Webinars**

Two webinars were hosted to introduce people to the JHA template & answer questions

#### **FAQ Sheet**

Answers frequently asked questions

#### **Policy Guidance**

ARS Policy & Procedure 160.1 Job Hazard Analysis Provides policy and responsibilities and establishes criteria for conducting a Job Hazard Analysis for hazardous operations

biohazard waste materials via high pr	clave/high pressure steam sterilizer (Yamato), iets		Agricultural Research Service Location/Unit: Task or Process Description: brus Tools & Equipment Required: gas Hazardous Materials: Mixed fuel Special Requirements: Name		JHA No:	
ask or Process Description: Sterili iohazard waste materials via high pr fools & Equipment Required: autoc ags, autoclave tape, autoclave bask lazardous Materials: possible biolog pecial Requirements: alysis Basic Job Steps (List steps in order of operation) repare materials for cerilization/decontamination.	ization of equipment/decontamination of potent ressure and temperature clave/high pressure steam sterilizer (Yamato), rets gical materials (e.g. flying debris, dust, vapors) Overfilled trays/bags may spill. Sealed	autoclave	Location/Unit: Task or Process Description: brus Tools & Equipment Required: gas Hazardous Materials: Mixed fuel	sh cutter / weed eater	quipment:	
ags, autoclave tape, autoclave bask azardous Materials: possible biolog pecial Requirements: alysis Basic Job Steps (List steps in order of operation) repare materials for erilization/decontamination.	gical materials           Potential Hazards           (e.g. flying debris, dust, vapors)           Overfilled trays/bags may spill. Sealed		Hazardous Materials: Mixed fuel	oline powered brush cutter		
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Basic Job Steps (List steps in order of operation) repare materials for terilization/decontamination.	(e.g. flying debris, dust, vapors) Overfilled trays/bags may spill. Sealed	Mitigation Controls	Special Requirements. None	Special Requirements: None		
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Prepare materials for sterilization/decontamination.	Overfilled trays/bags may spill. Sealed	TRANSFER AND	Basic Job Steps (List steps in order of operation)	<b>Potential Hazards</b> (e.g. flying debris, dust, vapors)	Mitigation Controls	
Fransport materials to autoclave.		Do not exceed weight limit of autoclave bag. Loosely seal bags and loosen all caps/lids 1/4 turn. Containers holding liquid should not be overfilled to avoid the containers from "boiling over". Keep liquid volumes as small as possible. Do not overtighten lids.	Fueling unit : - Always mix and pour outdoors,	Fuel spill or exposure, fire,	<ul> <li>No smoking during operating,</li> <li>Engine off and cool before refueling.</li> <li>Move cutter away from refueling area before starting engine</li> </ul>	
	Muscle strain from lifting. Trip and fall hazard from overfilled cart.	Use both hands and bend knees when lifting/ loading cart; wear closed-toe shoes. Use two- man lift or secondary containers to transport items.			<ul> <li>Must use personal protective equipment, hearing protection, gloves, eye protection boots, first aid kit nearby</li> </ul>	
Load autoclave. 1a. If autoclave not previously in use. Confirm 1500 mL water is present in the drain bottle. Fill bottom of chamber with 2800-3000 mL distilled water. Place materials into autoclave basket (required) and load chamber. Be sure to not block the steam exhaust port when loading the chamber.	1a. Trip and fall hazard due to water spill. Pinch point or impact of hands/fingers between lid and chamber. Muscle strain from lifting/loading.	1a. Clean-up all spills immediately. Use secondary container to transport water. Be careful of lid as it swings open. Use both hands and bend knees when lifting/loading chamber.	<ul> <li>Inspect brush cutter blade prior to operation for tightness and any damage.</li> <li>Hold body of machine on the flat ground surface with left hand before pulling out cord to start.</li> </ul>	Cutting attachment will start to rotate immediately when starting the engine with the choke in either the choke or start throttle position. - Cuts,	<ul> <li>To keep the blade from rotating while starting press throttle locko and throttle trigger, then press start throttle button. This keeps th motor in idle while starting.</li> <li>Wear gloves while inspecting blades and parts.</li> </ul>	
b. If autoclave previously in use. Open lid only if pressure gauge reads "O si". Open slowly to release excess team (stand to side). Open lid fully and emove autoclave basket. Confirm level f fluid in the water bottle; drain as eeded ( <b>never</b> drain during autoclave	1b. Opening autoclave may result in burns from hot steam release. Burns from contacting hot surfaces on interior of chamber. Pinch point or impact of hands/fingers between lid and base. Muscle strain from lifting/loading. Trip and fall hazard due to water spill.	1b. Partially open lid to release excess steam. Stand to the side to avoid exposure. Use hot mitts and wear safety glasses and a lab coat. Be mindful that the autoclave chamber will remain hot for a few minutes after opening the lid. Be careful of lid as it swings open. Use both hands and bend knees when lifting/loading	<ul> <li>Start machine by pulling on starter cord, use choke as needed</li> </ul>	- flying debris, exhaust fumes, noise	<ul> <li>Pull cord quickly and smoothly, without excessive force.</li> <li>Release throttle lockout only whe ready to cut. Do not allow unit to idle in one place too long, wear hearing protection (plugs/muffs)</li> </ul>	
peration). Fill chamber with water as eeded. Place materials into autoclave asket (required) and load chamber. Be ure to not block the steam exhaust port hen loading the chamber.		chamber. Clean-up all spills immediately. Use a secondary container to transport water.	<ul> <li>Before starting operation to cut look around you to make sure no people or animals are nearby.</li> </ul>	<ul> <li>Keep personnel, especially children and animals at least 50 feet away while cutting.</li> <li>Debris in work area could become airborne, flying debris.</li> </ul>	<ul> <li>Stop machine if people or anima approach, stop before swinging around.</li> <li>Avoid going over ditches and ha borders before shutting off machine.</li> </ul>	
Close lid (1/4-1/2 turn after lid touches ne chamber). Make sure lid is sealed. Itart autoclave (review manufacturer's nanual as needed for sterilization mes). Confirm rise in psi.	Pinch point or impact of hands/fingers between lid and chamber. Electrocution.	Be careful of lid as it seals. Ensure that equipment is properly plugged in with no exposed wires.			<ul> <li>- Notice the slope, stones and other objects that could be hazardous.</li> </ul>	
Innes), Comminise in psr. Jnload autoclave. Open lid only if pressure gauge reads "O psi". Open slowly to release excess steam (stand to side). Open lid fully and emove autoclave basket. Confirm level	Opening autoclave may result in burns from hot steam release. Burns from contacting hot surfaces on interior of chamber. Pinch point or impact of hands/fingers between lid and chamber. Muscle strain from lifting/loading. Trip	Partially open lid to release excess steam. Stand to the side to avoid exposure. Use hot mitts and wear safety glasses and a lab coat. Be mindful that the autoclave chamber will remain hot for a few minutes after opening the	<ul> <li>After finish cutting, turn off machine and clean it.</li> <li>clean blade.</li> </ul>	Blade is sharp and could cut off fingers.	<ul> <li>Stop machine before clearing an debris from the guard or blade.</li> <li>Clean blade with very high caution using cut resistant gloves.</li> </ul>	
f fluid in the water bottle; drain as	and fall hazard due to water spill.	lid, wait up to 10 minutes before removing	Analysis Summary			
eeded ( <b>never</b> drain during autoclave peration).		items. Be careful of lid as it swings open. Use both hands and bend knees when lifting/loading chamber. Clean-up all spills immediately. Use a	Engineering Controls Required: Vacuum and/or natural ventilation to	Administrative Controls/Training Required:	Personal Protective Equipment Required:	
Furn-off autoclave	none	secondary container to transport water.	remove airborne dust and debris	If needed post warning signs. Do routine maintenance of brush cutter and follow	Safety glasses/goggles. Face shield. Earplugs. Dust mask. Safety footwear.	
nalysis Summary			Emorranay Contact	safety precautions.	Work gloves-	
			Emergency Contact: Supervisor- RL:	Analysis By:		
ingineering Controls Required: Autoclave should be checked for amage/leakage prior to each use nd cleaned/emptied after each se.	Administrative Controls/Training Required: general lab safety training, autoclave SOP, demonstration of autoclave operation by supervisor. Regular preventive	Personal Protective Equipment Required: Disposable gloves, full-length lab coat, eye protection, hot mitts/heat resistant gloves, closed-toe shoes	Safety-	For use of this Form see Instructions	Page 1 of 1	
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Agricultural Research Service	Job Hazard Analysis	JHA No:	US	DA Agricultural Research	Job Hazard Analysis	JHA No:
Location/Unit:	Photo of Task/E			Research Service		
biohazard waste materials via high pr				cation/Unit: sk or Process Description: brush	cutter / weed eater	equipment:
bags, autoclave tape, autoclave bask		autoclave	То	ols & Equipment Required: gaso		
Hazardous Materials: possible biolo	gical materials	- FE	Ha			
Special Requirements:			Sp	ecial Requirements: None		
inalysis			Anal	lysis		
Basic Job Steps (List steps in order of operation)	Potential Hazards (e.g. flying debris, dust, vapors)	Mitigation Controls		Basic Job Steps (List steps in order of operation)	Potential Hazards (e.g. flying debris, dust, vapors)	Mitigation Controls
Prepare materials for sterilization/decontamination.	Overfilled trays/bags may spill. Sealed bags/bottles may explode.	Do not exceed weight limit of autoclave bag. Loosely seal bags and loosen all caps/lids 1/4 turn. Containers holding liquid should not be overfilled to avoid the containers from "boiling over". Keep liquid volumes as small as possible. Do not overtighten lids.		eling unit : - Always mix and pour tdoors,	Fuel spill or exposure, fire,	<ul> <li>No smoking during operating,</li> <li>Engine off and cool before refueling.</li> <li>Move cutter away from refueling area before starting engine</li> </ul>
Transport materials to autoclave.	Muscle strain from lifting. Trip and fall hazard from overfilled cart.	Use both hands and bend knees when lifting/ loading cart; wear closed-toe shoes. Use two- man lift or secondary containers to transport items.				<ul> <li>Must use personal protective equipment, hearing protection, gloves, eye protection boots, first aid kit nearby</li> </ul>
Load autoclave. 1a. If autoclave not previously in use. Confirm 1500 mL water is present in the drain bottle. Fill bottom of chamber with 2800-3000 mL distilled water. Place materials into autoclave basket (required) and load chamber. Be sure to not block the steam exhaust port when loading the chamber.	1a. Trip and fall hazard due to water spill. Pinch point or impact of hands/fingers between lid and chamber. Muscle strain from lifting/loading.	1a. Clean-up all spills immediately. Use secondary container to transport water. Be careful of lid as it swings open. Use both hands and bend knees when lifting/loading chamber.		<ul> <li>Inspect brush cutter blade prior to operation for tightness and any damage.</li> <li>Hold body of machine on the flat ground surface with left hand before pulling out cord to start.</li> </ul>	Cutting attachment will start to rotate immediately when starting the engine with the choke in either the choke or start throttle position. - Cuts,	<ul> <li>To keep the blade from rotating while starting press throttle lockout and throttle trigger, then press start throttle button. This keeps the motor in idle while starting.</li> <li>Wear gloves while inspecting blades and parts.</li> </ul>
1b. If autoclave previously in use. Open lid only if pressure gauge reads "0 psi". Open slowly to release excess steam (stand to side). Open lid fully and remove autoclave basket. Confirm level of fluid in the water bottle; drain as needed ( <b>never</b> drain during autoclave	1b. Opening autoclave may result in burns from hot steam release. Burns from contacting hot surfaces on interior of chamber. Pinch point or impact of hands/fingers between lid and base. Muscle strain from lifting/loading. Trip and fall hazard due to water spill.	1b. Partially open lid to release excess steam. Stand to the side to avoid exposure. Use hot mitts and wear safety glasses and a lab coat. Be mindful that the autoclave chamber will remain hot for a few minutes after opening the lid. Be careful of lid as it swings open. Use both hands and bend knees when lifting/loading		<ul> <li>Start machine by pulling on starter cord, use choke as needed</li> </ul>	- Muscle strain - flying debris, exhaust fumes, noise	<ul> <li>Pull cord quickly and smoothly, without excessive force.</li> <li>Release throttle lockout only when ready to cut. Do not allow unit to idle in one place too long, wear hearing protection (plugs/muffs)</li> </ul>
operation). Fill chamber with water as needed. Place materials into autoclave basket (required) and load chamber. Be sure to not block the steam exhaust port when loading the chamber.		chamber. Clean-up all spills immediately. Use a secondary container to transport water.		<ul> <li>Before starting operation to cut look around you to make sure no people or animals are nearby.</li> </ul>	<ul> <li>Keep personnel, especially children and animals at least 50 feet away while cutting.</li> <li>Debris in work area could become airborne, flying debris.</li> </ul>	<ul> <li>Stop machine if people or animals approach, stop before swinging around.</li> <li>Avoid going over ditches and hard borders before shutting off</li> </ul>
Close lid (1/4-1/2 turn after lid touches the chamber). Make sure lid is sealed. Start autoclave (review manufacturer's manual as needed for sterilization times). Confirm rise in psi.	Pinch point or impact of hands/fingers between lid and chamber. Electrocution.	Be careful of lid as it seals. Ensure that equipment is properly plugged in with no exposed wires.				machine. - Notice the slope, stones and other objects that could be hazardous.
Unload autoclave. Open lid only if pressure gauge reads "0 psi". Open slowly to release excess steam (stand to side). Open lid fully and remove autoclave basket. Confirm level	Opening autoclave may result in burns from hot steam release. Burns from contacting hot surfaces on interior of chamber. Pinch point or impact of hands/fingers between lid and chamber. Muscle strain from lifting/loading. Trip	Partially open lid to release excess steam. Stand to the side to avoid exposure. Use hot mitts and wear safety glasses and a lab coat. Be mindful that the autoclave chamber will remain hot for a few minutes after opening the		<ul> <li>After finish cutting, turn off machine and clean it.</li> <li>clean blade.</li> </ul>	Blade is sharp and could cut off fingers.	<ul> <li>Stop machine before clearing any debris from the guard or blade.</li> <li>Clean blade with very high caution using cut resistant gloves.</li> </ul>
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Turn-off autoclave	none	secondary container to transport water.		nove airborne dust and debris	If needed post warning signs. Do routine maintenance of brush cutter and follow	Safety glasses/goggles. Face shield. Earplugs. Dust mask. Safety footwear.
Analysis Summary				<b>2</b> • • •	safety precautions.	Work gloves-
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Engineering Controls Required: Autoclave should be checked for damage/leakage prior to each use and cleaned/emptied after each use.	Administrative Controls/Training Required: general lab safety training, autoclave SOP, demonstration of autoclave operation by supervisor. Regular preventive maintenance on unit.	Personal Protective Equipment Required: Disposable gloves, full-length lab coat, eye protection, hot mitts/heat resistant gloves, closed-toe shoes		<b>fety-</b> 5/2017	For use of this Form see Instructions	Page 1 of 1
No extension cords Emergency Contact: Supervisor- RL-	Analysis By:	Reviewed By & Date				
Safety-						

# **Results & Next Steps**

**Results:** Five ARS locations across the country have tested the JHA template and the template has been well-received. A final package was submitted to ARS leadership for review on 8/20/2018.

Next Steps: Final agency-wide implementation of the JHA template is expected to be February 2019. More nation-wide training will be performed before agency-wide implementation.



#### **Example JHAs**