SAMPLE DOCUMENTATION PRODUCTION OF DAIRY PRODUCTS IN FOOD SERVICE ESTABLISHMENTS





		Production of Mozzare	ella in Food Servic	e Establishmen	t
<i>Mozzareli</i> process w cheese wi cured in a	a is a popular melting cher here the curd is stretched th good meling properties whey based brine.	ese. It is made using the past and pulled to develop the tex that is used fresh and in cook	a filata technique. Th ture. The result is a s ing. This traditional i	nis is a stretchy recipe is	
STANDAR	D RECIPE			1	
10 Litr	es of pasteurized milk				
Bacte	rial culture (follow manufa	cturers instructions)			
5 mL c	alcium chloride (dilute wit	h water)			
5 mL r	ennet (dilute with water)				
Boiled	potable water				
Preparatio	on of 8% w/w salt brine so	lution.			
200 g	of non iodized salt with 2.3	3 L of whey			
Equipme	ent List				
Thermon	neter	Whisk	Measuring	spoons	Kettle/Pot
Curd knif	e	Colander	Cheese clo	th	Catch bowl for whey
pH meter	r	Cutting board	Ice Bath		Neoprene gloves
		PROCESS BA	SED FOOD SAFETY	' PLAN	
Step #	Process Step	Potential H	azards	In	structions and Outcomes
1	Purchase and refrigerate milk	Biological Pathogen contamination due is past best before date. Pathogen contamination due falling onto/into uncovered p Pathogen growth due to time	to using product that to condensation roduct. /temperature abuse.	 Purchase and us approved sources Keep pasteurized packaging, as purce Store at 4°C or component of the second secon	e only pasteurized dairy ingredients from d dairy ingredients in original commercial chased, until use. colder. ducts where the best before date has expired.

	PROCESS BASED FOOD SAFETY PLAN				
Step #	Process Step	Potential Hazards	Instructions and Outcomes		
2	Preoperational Checks	 Biological Pathogen contamination due to incomplete sanitation procedures. Chemical Cross contamination due to improper separation of activities. Contamination with non-food chemicals due to residual cleaners or sanitizers. Contamination with non-food chemicals due to mishandling of sanitizer spray bottlers during use or filling. 	 Inspect, clean and sanitize designated work area. Inspect equipment, utensils, and processing areas (clean and sanitized). Use written recipe each time you make the product to ensure consistency of measurements and that all steps in the production process are followed. Label the sanitizer spray bottles to indicate the content (non-food chemical). 		
3	Stage Ingredients	BiologicalPathogen growth due to time/temperature abuse.Pathogen contamination due to unsanitary equipment.Pathogen cross-contamination due to improper employee handling practices.ChemicalContamination with non-food chemicals due to residual cleaners or sanitizers.Allergens Allergen cross contamination due to improper separation of activities.	 There are only a few ingredients involved in making mozzarella: milk, bacterial culture, calcium chloride and rennet. Whey is reserved from the batch and mixed with salt to prepare the storage brine. Time and temperature control are key success factors when making mozzarella cheese. The operator must establish the rate of acidity development for this process and record for every batch. Use Mozzarella batch report. Calcium chloride and rennet must be diluted before adding to milk. Prepare fresh for each batch of mozzarella. Dilute with water that has been boiled and cooled. Organize work area. A pH meter is essential when making mozzarella. Stretching the curd to develop the desired texture is best done between pH 4.9 and 5.2. Follow batch report and record pH change from start through to end of process. 		

	PROCESS BASED FOOD SAFETY PLAN				
Step #	Process Step	Potential Hazards	Instructions and Outcomes		
4	Heat milk to inoculation temperature	 Biological Pathogen growth due to time/temperature abuse (too slow heating rate, incorrectly calibrated thermometer). Pathogen contamination due to unsanitary equipment. Pathogen contamination due to poor hygiene and improper handling by employees. Chemical Contamination with non-food chemicals due to residual cleaners or sanitizers. Allergens Contamination by allergens due to improper separation of activities. 	 The bacterial culture used for mozzarella has an optimum growth temperature between 35-40°C. Heat milk to inoculation temperature (reach temperature within 1 hour). Use a double boiler or water bath. Example: heat to 37°C (refer to starter culture requirements). Turn off heat Cover and hold to maintain temperature. 		
5	Prepare Bacterial Culture	BiologicalPathogen contamination due to poor hygiene and improper handling by employees.Pathogen contamination due to unsanitary equipment.ChemicalContamination with non-food chemicals due to residual cleaners or sanitizers.AllergensAllergen cross contamination due to improper employee handling practices.	 Use only approved commercial starter culture for cheese. Check that culture is still within the expiry date. Follow the manufacturer's instructions for usage rate and incubation requirements. Hygienically measure out the required amount of starter culture from the culture package. Hygienically close the culture package and return to storage. For foil packages, use an alcohol wipe (~60% alcohol content) to sanitize the outside of the package before sealing up. Place the package in a clean, food-grade re-sealable bag or container and store container as per the manufacturer's instructions. 		

	PROCESS BASED FOOD SAFETY PLAN					
Step #	Process Step	Potential Hazards	Instructions and Outcomes			
6	Add Bacterial Culture (inoculate)	 Biological Pathogen contamination due to poor hygiene and improper handling by employees. Pathogen contamination due to unsanitary equipment. Chemical Contamination with non-food chemicals due to residual cleaners or sanitizers. Allergens Presence of allergens due to improper separation of activities. 	 Check that bacterial culture is still within the expiry date. Record lot code of culture used on batch record. Sprinkle the bacterial culture directly into the processing container, or premix the culture with a small volume of the cream before adding to the processing container. For the premix method, hygienically remove a small volume of cooled cream and mix in the starter culture. When the culture is dispersed, pour the mix back into the processing container. Mix gently and thoroughly to disperse the culture. 			
7	Ripen	<u>Biological</u> Pathogen growth due to time/temperature abuse. <u>Allergens</u> Allergen cross contamination due to improper separation of activities.	 Cover the pot and maintain temperature at incubation temperature (32-35°C). A water bath is useful for temperature control. Record starting pH. Hold at this temperature for 45 minutes. There is only a slight pH drop at this point but this acidity development prepares the milk for the next step, coagulation. 			

		PROCESS BASED FOOD SAFETY	Y PLAN
Step #	Process Step	Potential Hazards	Instructions and Outcomes
8	Add calcium chloride	<u>Biological</u> Pathogen growth due to time/temperature abuse.	• Dilute calcium chloride in boiled and cooled water before addition to milk. If using a prepared solution check that it is still within the expiry date. Record lot code on batch record.
	F	Pathogen contamination due to poor hygiene and improper handling by employees.	 Add calcium chloride solution by mixing gently and thoroughly to disperse.
	CaCl2	Pathogen contamination due to unsanitary equipment.	 Allow the milk to rest for 10 minutes after addition of calcium chloride before next step.
		<u>Chemical</u> Contamination with non-food chemicals due to residual cleaners or sanitizers.	 Maintain temperature and record time and temperature on batch record.
		Allergens	
		Presence of allergens due to improper separation of activities.	
9	Add coagulant (rennin)	<u>Biological</u> Pathogen growth due to time/temperature abuse.	 Check that rennet solution is still within the expiry date. Record lot code on batch record.
		Pathogen contamination due to poor hygiene and improper handling by employees. Pathogen contamination due to unsanitary	 Mix gently and thoroughly to disperse the the rennin. Cover and allow milk to rest for 1 hour. Maintain temperature at 32-35°C. Record time and temperature on batch record.
	COAGULANT (RENNET)	equipment. Chemical	• The milk will begin to coagulate. The curd will become firm and will separate from whey.
		Contamination with non-food chemicals due to residual cleaners or sanitizers.	• Test curd after one hour. A clean break is desired. Use a sanitized curd knife and cut curd at a 45 ° angle. Cut edge
		<u>Allergens</u> Presence of allergens due to improper separation of activities.	should be clean and the whey should look clear, not milky. If too soft allow to sit an additional 15 minutes.

	PROCESS BASED FOOD SAFETY PLAN				
Step #	Process Step	Potential Hazards	Instructions and Outcomes		
10	Cut curd and expel whey	Biological Pathogen growth due to time/temperature abuse (too slow heating rate, incorrectly calibrated thermometer). Pathogen growth due to poor hygiene and improper handling by employees	 Use a sanitized curd knife and cut curds into 2 cm cubes. Allow to rest undisturbed for 30 minutes to continue concentration of curd and release of whey. Maintain temperature at 32-35°C. After 30 minutes begin the slow increase in temperature to 42 °C. Baise temperature slowly. It should take about 30 		
		Pathogen contamination due to unsanitary equipment. Chemical Contamination with non-food chemicals due to incomplete sanitation procedures.	 42 °C. Raise temperature slowly. It should take about so minutes to increase to 42 °C. If temperature is raised too quickly the curd will not form. When 42 °C is reached, remove from heat, stir gently for 10 minutes to keep the curd moving. 		
11	Drain in cheese cloth	Biological Pathogen growth due to time/temperature abuse. Pathogen contamination due to unsanitary equipment. Pathogen contamination due to use of non food grade or unapproved chemical. Pathogen contamination due to improper employee hygiene practices.	 Wash hands and wear gloves before handling curd at this step. Prepare a cheese cloth lined colander. Place a catch bowl underneath to collect the whey as it drains off and reserve for use in brine. Use a ladle or slotted spoon to cut slices out of the curd and scoop it straight into the strainer for draining. Let drain for 15 minutes or until the whey stops dripping. 		
12	Incubate/Ferment	Biological Pathogen growth due to time/temperature abuse. Incomplete acidity development due to failure of culture/culture that is past code/inactive cultures. Allergens Allergen cross contamination due to improper separation of activities.	 Return the curd to pot and hold in 39-42 °C water bath for two hours. The curd will form a slab. Use a spatula and turn slab two or three times during the holding period. Monitor acidity development on batch record. 		

	PROCESS BASED FOOD SAFETY PLAN				
Step #	Process Step	Potential Hazards	Instructions and Outcomes		
13	Reach end point pH	 <u>Biological</u> Incomplete acidity development due to improper incubation temperature. Pathogen growth due to failure of culture/culture that is past code/inactive cultures. Pathogen growth due to time/temperature abuse. Pathogen contamination due to improper employee handling practices. Pathogen contamination due to unsanitary equipment. <u>Allergens</u> Allergen cross contamination due to improper employee handling practices. 	 CRITICAL CONTROL POINT (CCP1B) Endpoint pH 4.9 to 5.2 within 6 hours after starting culturing. Check the product pH at the expected completion time for the fermentation stage Important: The normal fermentation time is specific to your process and must be established during your product development. If the target pH has not been reached, continue incubating and continue the pH checks (every 15 minutes). Corrective Action: If the end point pH (pH 4.9 to 5.2) has not been reached after 1 hour past the expected incubation time, there is a problem with the batch and it must be discarded. Wash and sanitize all utensils, containers, and equipment before re-using them. Document on batch sheet or production logbook. 		
14	Prepare curd for stretching/kneading	BiologicalPathogen contamination due to contaminated waterPathogen contamination due to poor hygiene and improper handling by employees.Pathogen contamination due to unsanitary equipment.AllergensContamination by allergens due to improper separation of activities.	 Heat 3L of potable water to 76 to 82 °C and reserve. Transfer slab of curd to a warm colander and continue to drain and reserve whey. When whey has stopped dripping, transfer the curd to a sanitized cutting board and cut into 2.5 cm cubes. Place cubes in a large stainless steel bowl. Cover the curd with heated water. Wear protective gloves during this step. 		

	PROCESS BASED FOOD SAFETY PLAN				
Step #	Process Step	Potential Hazards	Instructions and Outcomes		
15	Stretch (Knead)	Biological Pathogen contamination due to poor hygiene and improper handling by employees. Pathogen growth due to time/temperature abuse due to taking too long to complete step	 Work the cubes into one large curd ball. Portion the curd ball into 2 or 3 ropes of stretched curd. Work quickly. Curd may cool during shaping. Dip curd in the hot water as needed. Stretch rope of curd and fold onto itself. Repeat until curd is homogenous, shiny and smooth. Continue shaping curd. Break curd rope into smaller pieces and shape individual balls. Stretch the ball and tuck the ends under. Do not overwork or cheese will have a tough texture. 		
17	Portion and cool in ice bath	Biological Pathogen contamination due to contaminated water or ice Pathogen contamination due to poor hygiene and improper handling by employees.	 Prepare an ice water bath. Plunge the small curd ball into the ice water bath and hold for 10 minutes. 		
18	Store in brine	BiologicalPathogen contamination and growth due to incorrect salt concentration in brine, contaminated brinePathogen contamination due to uncovered or unsealed containers (improper packaging).PhysicalHazardous extraneous material contamination due to uncovered or unsealed containers (improper packaging).	 Place mozzarella balls in 8% salt w/w brine and transfer to cooler (4°C) for storage. Brine may need some pH adjustment if it made with water. Allow the mozzarella balls to remain in brine up to 8 hours. Flip the balls over in the brine. Remove from brine. 		

Mozzarella_September 2022

PROCESS BASED FOOD SAFETY PLAN						
Step #	Process Step	Potential Hazards	Instructions and Outcomes			
19	Package/Label/Store	Biological Pathogen contamination due to contaminated water Pathogen contamination due to improper employee handling practices. Chemical Contamination with non-food chemicals due to residual cleaners or sanitizers.	 After removal from brine, store mozzarella in a lidded container. Use immediately or store in the refrigerator and use within three days. Label container with product date or use by date. 			

Product Description Form (Foodservice)

Product Category	Fresh Cheese
1. What is your product name and weight/volume?	Mozzarella
2. What type of product is it (e.g. raw, ready-to-eat, ready-to-cook, or ready for further processing)	Ready to Eat (RTE), ingredient in meal preparation.
3. What are your product's important food safety characteristics (e.g. acidity, water activity, salinity, etc.)?	Acidified (or cultured), refrigerated, short shelf life.
4. What allergens does your product contain?	Milk
5. What restricted ingredients (preservatives, additives, etc.) does your product contain, and in what amounts e.g. grams)	None
6. How do you store your product e.g. keep refrigerated, keep frozen, keep dry) in your estblishment and when you ship your product?	Store in lidded container in refrigerator.
7. What is the shelflife of your product under proper storage conditions?	3 days refrigerated (4°C).
8. Who will consume your product (e.g. the general public, the elderly, the immunocompromised, infants?)	Food Service customers.
9. How might the consumer mishandle your product and what safety measures will prevent this?	Mishandled in kitchen.
10. Where will the product be sold?	At own facility.
11. What information is on your product label?	Keep refrigerated, production date (lot code).



Critical Control Points Table: Mozzarella

1. Identifying Hazards	2. Identifying Critical Control Points (CCP)	3. Establishing Critical Limits:	4. Establishing Monitoring Procedures (who, what, how and when)	5. Establishing Corrective Actions:	6. Establishing Verification Procedures (who, what, how and when)	7. Keeping Records
Pathogen growth due to too slow rate of acid development and time and temperature abuse.	CCP1B Reach end point pH	Endpoint pH between 4.9 and 5.2 within 6 hours from the start of production.	 Production worker checks pH with clean and sanitized calibrated pH meter. Check pH of mozzarella every 15 minutes during fermentation step. Record on batch report. 	 When critical limits are not being met for one or more sample. 1. If target pH has not been achieved continue for one more hour. 2. Discard the batch if end point pH is not reached after this additional incubation time. The batch is contaminated and should not be used. 3. Record as corrective action on batch report. 4. Clean and sanitize utensils, containers and equipment before reusing. 	 Operator will establish fermentation time for mozzarella process. Operator reviews and signs batch reports at end of production day to ensure that it has been properly completed. Once per week, the Operator ensures that the pH checks follow the procedure (observes production worker in their task). If a non-conformance is found during the verification procedure, immediately investigate the cause of the non-conformance and take necessary corrective actions to prevent reoccurrence. Record all observations on the batch report, including the date, the time and initials. 	Mozzarella Batch Report pH Meter Calibration Record

Note: CCPs are points in your process where controls are essential to preventing hazards or reducing them to acceptable levels. You may not be able to prevent or reduce the risk of the hazard at any later step. A CCP is measureable. Some examples of measureable CCPS in dairy processing are the time and temperature of pasteurization, the pH of a fermented dairy product and the water activity of a dried product such as skim milk powder. Foodservice establishments may include additional preparation steps as CCPs particularly when there is no cook step in the operation. These additional CCPs control the hazards associated with crosscontamination due to sanitation and personnel.

Cheese Type	Cheese Batch Report Mozzarella	Lot Code:	22118	
Date Made:	4/28/2022	Cheesemaker:	Joe	
Best Before Date:	22 MA 01			
Preoperational checks done	Yes, JG			

Staging Ingredients

Dairy Ingredient	Amount	Code/Lot	Supplier
Homo Milk (3.25%BF)	10 Litre	MA 22	Saputo
Bacterial Culture	5 g	L20123A	Danisco
Calcium Chloride	5 mL	24043	Danisco
Rennin	5 mL	24041	Danisco
Salt	200 g	21028	Sifto
Whey	2.3 L	fresh from	production

Process Step	Time	Temperature	рН	Comments
Heat Milk	9:00	4	6.3	
Add Bacterial Culture and ripen	9:20	37		
Add Calcium Chloride	10:05	35		
Add Rennin	10:15	35		
Cut Curd	11:15	35		curd breaks clean
Rest	11:45	35		
Heat slowly and stir	11:45	38	5.9	
	12:00	40		
	12:15	42		Curd has settled to bottom of pot.
Drain in cheese cloth	13:45			
Incubate/Ferment to pH 4.9-5.2	15:45	39	5.9	
	14:00		5.5	
	14:15		5.1	
	14:30		4.9	
Stretch and chill in ice bath	15:00			
Store in brine (record time transferred to storage next day)	8:00	4	4.9	

Observed Deviations and Corrective Actions

Yield

45 X 50 g mozzarella balls

2.2 Kg Tub with brine

Observed Deviations and Corrective Actions

Date of Record Review: 2-May-22 Verification by: M. Smith