REQUEST FOR VARIANCE

State Form 51184 (R / 5-13)
Food Protection Program

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FOOD PROTECTION PROGRAM
INDIANA STATE DEPT. OF HEALTH

INDIANA STATE DEPARTMENT OF HEALTH
Telephone: 317/234-8569 **FAX: 317/233-9200**

1. Individual Submitting Request: Date: __ / __ / ____

Name: H.J. Kim Telephone: (651) 294-7000 **Fax:** (651) 294-7001

Mailing Address: 895 Blue Gentian Road, Suite 6 (Number and Street) Email: kim@sushiavenue.com

P.O. Box	Eagan (City)	MN (State)	55121 (ZIP Code)

2. Person/Organization Seeking Variance:

Name: Sushi Avenue, Inc Email: kim@sushiavenue.com

Mailing Address: 895 Blue Gentian Road, Suite 6 (Number and Street)

P.O. Box	Eagan (City)	MN (State)	55121 (ZIP Code)

3. Food Establishment(s) for Which Variance is Sought

Include the following information for each food establishment: *(List here or attach additional pages if necessary.)*

- Physical Location *(If different than mailing address)*: 8750 US HWY 31, Indianapolis, IN 46227
- Mailing Address: 895 Blue Gentian Road, Suite 6, Eagan, MN 55121 (Number, Street, City, State, and ZIP Code)
- Telephone Number: (651) 294-7000 Fax Number: (651) 294-7001
- Person at each retail food establishment most responsible for supervising: _____

4. State how the proposal varies from each rule requirement, citing relevant rule sections by number: *(Attach additional pages if necessary.)*

Section 187 of 410 IAC 7-24, "Retail Food Establishment Sanitation Requirements" relating to the production of sushi rice as a non-potentially hazardous food (non-TCS: non-Time/Temperature controlled for Safety Food) from a potentially hazardous food (TCS: Time/Temperature Controlled for Safety Food) by a process of acidification.

5. Explain how the potential public health hazards and/or nuisances will be alternatively addressed by the proposal. Include supporting studies, Hazard Analysis Critical Control Point (HACCP) Plan(s), standard sanitation operating procedures, and/or any other evidence: *(Attach additional pages, if necessary.)*

A Critical analysis and studies shown that acidifying rice with of pH value of 4.2 or below and holding at room temperature that it will be safe and the acid will control the growth of B. cereus.

6. List how the proposal demonstrates the following *(if applicable to the request)*:

A) How the proposal differs from what is common and usual in similar industry situations:
Rice is usually held by time and temperature standards

B) How the proposal is unique and not addressed in existing rules or law:
By holding the rice products by a pH value.

C) How the proposal does not diminish the protection of public health:
Studies show that following proper procedures (a pH value of 4.2 or below) and proper sanitation, rendering the rice safe to hold at room temperature.

D) How the proposal is based on new scientific or technological principle(s):
See attached validation for safe acidification study

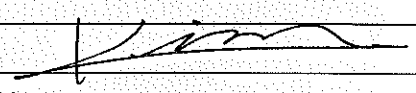
E) How the implementation of the variance would be practical:
See attachements

7. Explain how the person/organization seeking the variance will assure that all provisions of a granted variance will be enacted at each food establishment for which a variance has been granted:
For each batch of rice cooked, vinegar is added and then they perform 2 pH tests to verify that they rice is at or below a pH value of 4.2. These pH tests are documented in a log book noting dates, times and pH values.

8. List all affected parties known by the person/organization seeking a variance, including all affected regulatory authorities: *(Attach additional pages if necessary.)*
Marion County Public Health Department

9. Attach copies of any related variances, waivers or opinions issued by other governmental agencies.

For Office Use Only

10. Signature of Individual Making Request: 

Printed Name, Title: H.J. Kim, Sr. Vice President

White Sushi Rice

Receiving

A. Check the physical condition of packaging for physical defects and insect infestation and check the food quality to determine its wholesomeness.
B. Cooked rice cannot be received by the store, only uncooked rice. All rice must be cooked fresh in the store.
C. Reject loads that do not meet the above criteria; notify the home office immediately.
D. Put sushi rice in the designated sushi area in the dry storage bay.
E. Rotate the delivery to facilitate the first-in-first-out method of stock rotation.

Storing (Dry)

A. Food and food packaging materials must always be kept 6" off the floor to reduce the chance of contamination.
B. Rice must be stored in a clean and dry area.
C. Opened bags of rice must be kept covered or the bag rolled closed at the top to prevent contamination.
D. Scoops with handles must be used to remove the rice from the bag. Do not use cups or utensils without handles.

Personal Hygiene

A. Employees must wash their hands thoroughly. Lather with soap for **at least 20 seconds** prior to sushi preparation.
B. Make sure to use a clean pair of disposable gloves prior to handling any food item.
C. Follow all other policies concerning personal hygiene and employee illness reporting requirements.

Cooking (Old Crop)

A. Clean and sanitize rice cooker prior to use.
B. Measure 7 pounds of U.S. No. 1 Extra Fancy Premium Medium Grain Rice into Zojirushi NYC-36 cooking container.
C. Place Zojirushi NYC-36 cooking container into two compartment vegetable sink and run cold water into the cooking container letting the water overflow.
D. While water is running and overflowing, turn the rice by hand while wearing disposable gloves. Do this until water runs clean.
E. Once water runs clean, drain excess water and measure in 7.5 pounds of water into Zojirushi NYC-36 cooking container.
F. Place Zojirushi NYC-36 cooking container into Zojirushi NYC-36 rice cooker and cook for 45 minutes to a minimum internal temperature of 165°F.
G. Remove rice from cooker and place it in a clean, large, NSF approved plastic container.

Cooking (New Crop)

A. Clean and sanitize rice cooker prior to use.
B. Measure 7 pounds of U.S. No. 1 Extra Fancy Premium Medium Grain Rice into Zojirushi NYC-36 cooking container.

C. Place Zojirushi NYC-36 cooking container into two compartment vegetable sink and run cold water into the cooking container letting the water overflow.
D. While water is running and overflowing, turn the rice by hand while wearing disposable gloves. Do this until water runs clean.
E. Once water runs clean, drain excess water and measure in 8 pounds of water into Zojirushi NYC-36 cooking container.
F. Place Zojirushi NYC-36 cooking container into Zojirushi NYC-36 rice cooker and cook for 45 minutes to a minimum internal temperature of 165°F.
G. Remove rice from cooker and place it in a clean, large, NSF approved plastic container.

Remember: **There are two crops of rice (old and new) depending of the time of year. Be sure to verify which crop you are using; the bags are clearly marked on the front.**

Seasoning

A. Immediately after cooking the rice, add one quart of Sushi Avenue Brand Sushi Seasoning vinegar (acidity 2.9 % weight / volume) to the cooked rice in order to achieve a pH of 4.2 or below.
B. Stir rice thoroughly to ensure sushi seasoning is mixed into all areas.
C. Conduct a pH test (see instructions below). (CCP)
D. If pH is higher than 4.2 add sushi seasoning one cup at a time until pH is at or below 4.2.
E. Once a pH reading of 4.2 or below is reached, loosely cover rice with the container's lid and place the container in the cooler

Remember: **Place the container above all non-ready to eat foods.**

F. Every 15 minutes return to the rice, stir thoroughly and take a temperature reading until rice temperature is 70°F or below.
G. 30 minutes after the first pH test, test again and recheck pH level; discard if pH is above 4.2. (CCP)

Preparation

A. After the rice has reached a temperature of 70°F or below and a pH of 4.2 to 3.7, it is safe to remove the rice from the cooler and store at room temperature.
B. Food preparation must always be done on cleaned, sanitized and approved surfaces using cleaned, sanitized and approved utensils.
C. Wash hands and use clean gloves prior to making sushi.
D. Roll rice onto the sushi rolls using a Bamboo Mat wrapped with clean plastic food film. There should be several mats available and the mats must be changed at least **every 3 hours**.
E. Production using raw sushi fish should be done at the very end of the shift after all other sushi varieties are completed. If fully cooked sushi fish or non-fish items are to be prepared after raw sushi fish, a full sanitization must be performed immediately following preparation using raw sushi fish. This ensures that the raw sushi fish will not contaminate the fully cooked sushi fish and non-fish items.
F. Cooked rice cannot be used for sushi production the next day.
G. Prepare only small batches at a time to ensure freshness and quality; package and display within one hour.

Cooling Sushi

A. Sushi Chefs are responsible for cooling every batch of product to 41 degrees or below.
B. Make sure there is adequate air circulation around the containers.
C. Do not cover until the sushi is cooled, then cover.
D. Do not overload the capacity of refrigeration units, freezer and blast chiller.
E. Put sushi in blast chiller, refrigerator, or freezer for pre-chill to ≤41°F.
F. Use a clean sanitized and calibrated thermometer to check the temperature at the center of the sushi. Make sure that it reaches 41°F within 4 hours.
G. Throw away sushi if the cooling time and temperatures have not been reached.

Displaying Sushi

A. Package sushi for sale in clean, new packaging and display in a refrigerated case that is holding foods to an internal temperature **of 41°F or below.**
B. Do not over fill display case or place food above the load line.
C. Discard packages on display with that have passed their expiration.
D. Check the internal temperature of the displayed sushi **three times daily** to ensure unit is holding temperatures **at 41°F or below.**
E. Notify the store manager or person in charge immediately if improper temperatures are detected at times other than the unit's defrost times. Remove food from the defective unit and place it in another refrigerated unit or discard if temperatures are above 41° F for longer than one hour. Call Facility Maintenance to repair faulty refrigeration units.

Coding & Labeling

A. Label all packaged foods containing rice with a 1-day code from the time of completion.
B. Discard all food items on display that have passed expiration.
C. Label must list all known allergens in the packaged RTE item.

Brown Sushi Rice

Receiving

A. Check the physical condition of packaging for physical defects and insect infestation and check the food quality to determine its wholesomeness.
B. Cooked rice cannot be received by the store, only uncooked rice. All rice must be cooked fresh in the store.
C. Reject loads that do not meet the above criteria; notify the sales office immediately.
D. Put sushi rice in the designated sushi area in the dry storage bay.
E. Rotate the delivery to facilitate the first-in-first-out method of stock rotation.

Storing (Dry)

A. Food and food packaging materials must always be kept 6" off the floor to reduce the chance of contamination.
B. Rice must be stored in a clean and dry area.
C. Opened bags of rice must be kept covered or the bag rolled closed at the top to prevent contamination.
D. Scoops with handles must be used to remove the rice from the bag. Do not use cups or utensils without handles.

Personal Hygiene

A. Employees must wash their hands thoroughly. Lather with soap for **at least 20 seconds** prior to sushi preparation.
B. Make sure to use a clean pair of disposable gloves prior to handling any food item.
C. Follow all other policies concerning personal hygiene and employee illness reporting requirements.

Cooking

A. Clean and sanitize rice cooker prior to use.
B. Measure 7 pounds of U.S. No. 1 Premium Medium Grain Brown Rice into Zojirushi NYC-36 cooking container.
C. Place Zojirushi NYC-36 cooking container into a vegetable sink and run cold water into the cooking container letting the water overflow.
D. While water is running and overflowing, turn the rice by hand while wearing disposable gloves. Do this until water runs clean.
E. Once water runs clean, drain excess water and measure in 11 pounds of water into Zojirushi NYC-36 cooking container.
F. Place Zojirushi NYC-36 cooking container into Zojirushi NYC-36 rice cooker and cook for 45 minutes to a minimum internal temperature of 165°F.
G. Remove rice from cooker and place it in a clean, large, NSF approved plastic container.

Seasoning

A. Immediately after cooking the rice, add one quart of Sushi Avenue Brand Sushi Seasoning vinegar (acidity 2.9 % weight / volume) to the cooked rice in order to achieve a pH of 4.2 or below.
B. Stir rice thoroughly to ensure sushi seasoning is mixed into all areas.
C. Conduct a pH test. (see instructions below). (CCP)
D. If pH is higher than 4.2 add sushi seasoning one cup at a time until pH is at or below 4.2.
E. Once a pH reading of 4.2 or below is reached, loosely cover rice with the container's lid and place the container in the cooler

Remember: **Place the container above all non-ready to eat foods.**

F. Every 15 minutes return to the rice, stir thoroughly and take a temperature reading until rice temperature is 70°F or below.
G. 30 minutes after the first pH test, test again and recheck pH level; discard if pH is above 4.2. (CCP)

Preparation

A. After the rice has reached a temperature of 70°F or below and a pH of 4.2 to 3.7, it is safe to remove the rice from the cooler and store at room temperature.
B. Food preparation must always be done on cleaned, sanitized and approved surfaces using cleaned, sanitized and approved utensils.
C. Wash hands and use clean gloves prior to making sushi.
D. Roll rice onto the sushi rolls using a Bamboo Mat wrapped with clean plastic food film. There should be several mats available and the mats must be changed at least **every 3 hours**.
E. Production using raw sushi fish should be done at the very end of the shift after all other sushi varieties are completed. If fully cooked sushi fish or non-fish items are to be prepared after raw sushi fish, a full sanitization must be performed immediately following preparation using raw sushi fish. This ensures that the raw sushi fish will not contaminate the fully cooked sushi fish and non-fish items.
F. Cooked rice cannot be used for sushi production the next day.
G. Prepare only small batches at a time to ensure freshness and quality; package and display within one hour.

Cooling Sushi

A. Sushi Chefs are responsible for cooling every batch of product to 41 degrees or below.
B. Make sure there is adequate air circulation around the containers.
C. Do not cover until the Sushi is cooled, then cover.
D. Do not overload the capacity of refrigeration units, freezer and blast chiller.
E. Put Sushi in blast chiller, refrigerator, or freezer for pre-chill to ≤41°F.
F. Use a clean sanitized and calibrated thermometer to check the temperature at the center of the sushi. Make sure that it reaches 41°F within 4 hours.
G. Throw away sushi if the cooling time and temperatures have not been reached.

Displaying Sushi

A. Package sushi for sale in clean, new packaging and display in a refrigerated case that is holding foods to an internal temperature **of 41°F or below.**

B. Do not over fill display case or place food above the load line.
C. Discard packages on display with that have passed their expiration.
D. Check the internal temperature of the displayed sushi **three times daily** to ensure unit is holding temperatures **at 41°F or below.**
E. Notify the store manager or person in charge immediately if improper temperatures are detected at times other than the unit's defrost times. Remove food from the defective unit and place it in another refrigerated unit or discard if temperatures are above 41° F for longer than one hour.

Coding & Labeling

A. Label all packaged foods containing rice with a 1-day code from the time of completion.
B. Discard all food items on display that have passed expiration.
C. Label must list all known allergens in the packaged RTE item.

Seasoning

A. Immediately after cooking the rice, add one quart of Sushi Avenue Brand Sushi Seasoning vinegar (acidity 2.9 % weight / volume) to the cooked rice in order to achieve a pH of 4.2 or below.
B. Stir rice thoroughly to ensure sushi seasoning is mixed into all areas.
C. Conduct a pH test (see instructions below). (CCP)
D. If pH is higher than 4.2 add sushi seasoning one cup at a time until pH is at or below 4.2.
E. Once a pH reading of 4.2 or below is reached, loosely cover rice with the container's lid and place the container in the cooler

Remember: **Place the container above all non-ready to eat foods.**

F. Every 15 minutes return to the rice, stir thoroughly and take a temperature reading until rice temperature is 70°F or below.
G. 30 minutes after the first pH test, test again and recheck pH level; discard if pH is above 4.2. (CCP)

Preparation

A. After the rice has reached a temperature of 70°F or below and a pH of 4.2 to 3.7, it is safe to remove the rice from the cooler and store at room temperature.
B. Food preparation must always be done on cleaned, sanitized and approved surfaces using cleaned, sanitized and approved utensils.
C. Wash hands and use clean gloves prior to making sushi.
D. Roll rice onto the sushi rolls using a Bamboo Mat wrapped with clean plastic food film. There should be several mats available and the mats must be changed at least **every 3 hours**.
E. Production using raw sushi fish should be done at the very end of the shift after all other sushi varieties are completed. If fully cooked sushi fish or non-fish items are to be prepared after raw sushi fish, a full sanitization must be performed immediately following preparation using raw sushi fish. This ensures that the raw sushi fish will not contaminate the fully cooked sushi fish and non-fish items.
F. Cooked rice cannot be used for sushi production the next day.
G. Prepare only small batches at a time to ensure freshness and quality; package and display within one hour.

Cooling Sushi

A. Sushi Chefs are responsible for cooling every batch of product to 41 degrees or below.
B. Make sure there is adequate air circulation around the containers.
C. Do not cover until the Sushi is cooled, then cover.
D. Do not overload the capacity of refrigeration units, freezer and blast chiller.
E. Put Sushi in blast chiller, refrigerator, or freezer for pre-chill to ≤41°F.
F. Use a clean sanitized and calibrated thermometer to check the temperature at the center of the sushi. Make sure that it reaches 41°F within 4 hours.
G. Throw away sushi if the cooling time and temperatures have not been reached.

Multi Grain Sushi Rice

Receiving

A. Check the physical condition of packaging for physical defects and insect infestation and check the food quality to determine its wholesomeness.
B. Cooked rice cannot be received by the store, only uncooked rice. All rice must be cooked fresh in the store.
C. Reject loads that do not meet the above criteria; notify the sales office immediately.
D. Put sushi rice in the designated sushi area in the dry storage bay.
E. Rotate the delivery to facilitate the first-in-first-out method of stock rotation.

Storing (Dry)

A. Food and food packaging materials must always be kept 6" off the floor to reduce the chance of contamination.
B. Rice must be stored in a clean and dry area.
C. Opened bags of rice must be kept covered or the bag rolled closed at the top to prevent contamination.
D. Scoops with handles must be used to remove the rice from the bag. Do not use cups or utensils without handles.

Personal Hygiene

A. Employees must wash their hands thoroughly. Lather with soap for **at least 20 seconds** prior to sushi preparation.
B. Make sure to use a clean pair of disposable gloves prior to handling any food item.
C. Follow all other policies concerning personal hygiene and employee illness reporting requirements.

Cooking

A. Clean and sanitize rice cooker prior to use.
B. Measure 7 pounds of U.S. No. 1 Extra Fancy Multi Grain Rice into Zojirushi NYC-36 cooking container.
C. Place Zojirushi NYC-36 cooking container into two compartment vegetable sink and run cold water into the cooking container letting the water overflow.
D. While water is running and overflowing, turn the rice by hand while wearing disposable gloves. Do this until water runs clean.
E. Once water runs clean, drain excess water and measure in 13 pounds of water into Zojirushi NYC-36 cooking container.
F. Place Zojirushi NYC-36 cooking container into Zojirushi NYC-36 rice cooker and cook for 45 minutes to a minimum internal temperature of 165°F.
G. Remove rice from cooker and place it in a clean, large, NSF approved plastic container.

Displaying Sushi

A. Package sushi for sale in clean, new packaging and display in a refrigerated case that is holding foods to an internal temperature **of 41°F or below.**
B. Do not over fill display case or place food above the load line.
C. Discard packages on display with that have passed their expiration.
D. Check the internal temperature of the displayed sushi **three times daily** to ensure unit is holding temperatures **at 41°F or below.**
E. Notify the store manager or person in charge immediately if improper temperatures are detected at times other than the unit's defrost times. Remove food from the defective unit and place it in another refrigerated unit or discard if temperatures are above 41° F for longer than one hour.

Coding & Labeling

D. Label all packaged foods containing rice with a 1-day code from the time of completion.
E. Discard all food items on display that have passed expiration.
F. Label must list all known allergens in the packaged RTE item.

Sushi White Rice HACCP Flow Chart

Firm name: Sushi Avenue Inc

Firm address: 895 Blue Gentian Road. Suite #6
Eagan MN 55121

Sushi Bar Location
Location Address _____

_____

_____

Receiving

A. Check the physical condition of packaging for physical defects and insect infestation and check the food quality to determine its wholesomeness.

Preparation

Assemble all ingredients and utensils.

* Use of only approved ingredients permitted
* All utensils must be approved, cleaned and sanitized prior to use

Measure 7lbs of rice and 8lbs of water accurately.

Wash rice in cooking pot until water runs clear, drain and add premature water.

* Inspect the rice for physical contaminants and remove if it does not pose a threat to food safety; discard rice if they pose a threat to food safety.

Cooking &Seasoning

Switch rice cooker on and cook rice to a temp of at least 165^{0}F.

* Cooking the rice at high heat will reduce all vegetative pathogens to a safe level. Spores of Bacillus Cereus and C Perfringens will survive.

Empty rice into large NSF approved container and spread rice into a 2" thick even layer.

* Time is too short for any risk.

Measure one Quart seasoning(Sushi Avenue Brand Sushi Seasoning vinegar (acidity 2.9 % weight / volume)) and distribute evenly over entire surface of the rice. Run spatula through the rice in a slicing motion, lifting and turning to thoroughly mix in the seasoning.

* The seasoning will reduce pH levels to 4.2 or below of which complies with FDA rules and regulations for food safety. Growth of Bacillus Cereus and C Perfringens will be controlled or limited.

First pH test

CCP

Check the temperature and pH of the rice. A pH level of 4.2 or below must be attained. If proper pH level is not met, add vinegar and run test again. Record in the Temperature & pH log book.

* **CCP:** This is the first monitoring step to ensure that the control standard has been reached. The temp and pH of each batch of rice is recorded in the log book.

Once a pH of 4.2 or below is attained, loosely cover container with its lid and place it in the cooler.

* Place container above all non-ready to eat foods.

Second pH test

CCP

30 minutes after First pH test of the rice recheck pH level and Cool rice to 70^{0}F or below.

* **CCP:** This is the second monitoring step to ensure that the control standard has been reached. The temp and pH of each batch of rice is recorded in the log book.

Holding

Keep the rice temperature at / below 70^{0}F

Food borne illness hazards are controlled or limited.

Remove working portions to make sushi.

Discard left over rice after 12 hours.

HAZARD ANALYSIS WORKSHEET

Firm name: Sushi Avenue Inc
Firm address: 895 Blue Gentian Road. Suite #6 Eagan MN 55121
Sushi Bar Location Location Address _____

Product description: Cooked White Sushi Rice
Method of storage and distribution: Store at room temp, in NSF approved container
Intended use and consumer: To be eaten by the general public

1	2	3	4	5	6
Ingredient/ processing step	**Potential Hazards introduced, controlled or enhanced at this step.**	**Are any potential food-safety Hazard (yes/no)**	**Justify your decision for column 3**	**What preventative Measure(s) can be applied to prevent the significant hazards?**	**Is this step a critical control point? (yes/no)**
Receiving	**BIOLOGICAL** **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	No No No	**Biotical**- Low risk product; proper handling & Storage **Chemical**-Use approved chemicals only and proper storage away from food area to prevent **Physical**- Compliance with product specifications. Packaged product.		No
Preparation	**BIOLOGICAL** **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	No No Yes	**Biotical**- Personal hygiene and proper product handling **Chemical**-Use approved chemicals only and proper storage away from food area to prevent **Physical**- Remove foreign objects.	Inspect the rice for physical contaminants and remove if it does not pose a threat to food safety; discard rice if they pose a threat to food safety.	No
Cooking &Seasoning	**BIOLOGICAL** Pathogen growth **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	Yes No No	**Biological**- Cooking rice at 165°F will reduce all vegetative pathogens to safe level. **Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments. **Physical**- Employee vigilance.	Check Rice cooker	No
First pH test	**BIOLOGICAL** Spores of Bacillus Cereus and C Perfringens **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	Yes No No	**Biotical**- Spores of Bacillus Cereus and C Perfringens. This is the first monitoring step to ensure that the control standard has been reached **Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments. **Physical**- Employee vigilance.	Check the temperature and pH of the rice. A pH level of 4.2 or below must be attained. If proper pH level is not met, add vinegar and run test again. Record in the Temperature & pH log book.	Yes
Second pH test	**BIOLOGICAL** Pathogen growth **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	Yes No No	**Biotical**- Spores of Bacillus Cereus and C Perfringens. This is the second monitoring step to ensure that the control standard has been reached **Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments. **Physical**- Employee vigilance.	The final pH must reach 4.2 or lower to control the Bacillus Cereus. If pH is above 4.2 then rice must be discarded	Yes
Holding	**BIOLOGICAL** Pathogen growth **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	Yes No No	**Biotical**- At an increase time, pathogen growth can occur. **Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments. **Physical**- Employee vigilance.	Maintain temp below 70°F. Left over rice must be discarded after 12 hours.	No

HACCP PLAN FORM

Firm name: Sushi Avenue, Inc.

Firm address: 895 Blue Gentian Road. Suite #6
Eagan, MN 55121

Sushi Bar Location _____

Location Address _____

_____

Product description: Cooked White Sushi Rice

Method of storage and distribution: Store at room temp, in NSF approved container

Intended use and consumer: To be eaten without further cooking by general public

Critical Control Point(CCP)	Significant Hazard(s)	Preventive Measure(s)	Monitoring				Corrective Action(s)	Verification	Records
			What	How	Frequency	Who			
First pH test	**Biological** (Spores of Bacillus cereus)	pH ≤ 4.2	pH level	With Hanna brand calibrated pH meter	Every batch	Sushi chef	Incorrect levels requires addition of more vinegar and testing until correct level is reached	Record pH levels in log book Calibrate pH tester log	Review monitoring and corrective action records within one month of preparation
Second pH test	**Biological** (Spores of Bacillus cereus)	pH ≤ 4.2	pH level	With Hanna brand calibrated pH meter	Every batch, 30 minutes after First pH test of the rice	Sushi chef	Discard if pH is above 4.2.	Record pH levels in log book Calibrate pH tester log	Review monitoring and corrective action records within one month of preparation

Signature of Company Official: H.J. KIM

Date: 08/02/2013

Sushi Brown Rice HACCP Flow Chart

Firm name: Sushi Avenue Inc

Firm address: 895 Blue Gentian Road Suite#6
Eagan MN 55121

Sushi Bar Location _____

Location Address _____

Receiving

A. Check the physical condition of packaging for physical defects and insect infestation and check the food quality to determine its wholesomeness.

Preparation

Assemble all ingredients and utensils.

* Use of only approved ingredients permitted
* All utensils must be approved, cleaned and sanitized prior to use

Measure 7lbs of rice and 11lbs of water accurately.

Wash rice in cooking pot until water runs clear, drain and add premature water.

* Inspect the rice for physical contaminants and remove if it does not pose a threat to food safety; discard rice if they pose a threat to food safety.

Cooking &Seasoning

Switch rice cooker on and cook rice to a temp of at least 165^{0}F.

* Cooking the rice at high heat will reduce all vegetative pathogens to a safe level. Spores of Bacillus Cereus, and C Perfringens will survive.

Empty rice into large NSF approved container and spread rice into a 2" thick even layer.

* Time is too short for any risk.

Measure one Quart seasoning(Sushi Avenue Brand Sushi Seasoning vinegar (acidity 2.9% weight / volume)) and distribute evenly over entire surface of the rice. Run spatula through the rice in a slicing motion, lifting and turning to thoroughly mix in the seasoning.

* The seasoning will reduce pH levels to 4.2 or below of which complies with FDA rules and regulations for food safety. Growth of Bacillus Cereus and C Perfringens will be controlled or limited.

First pH test

CCP

Check the temperature and pH of the rice. A pH level of 4.2 or below must be attained. If proper pH level is not met, add vinegar and run test again. Record in the Temperature & pH log book.

* **CCP:** This is the first monitoring step to ensure that the control standard has been reached. The temp and pH of each batch of rice is recorded in the log book.

Once a pH of 4.2 or below is attained, loosely cover container with its lid and place it in the cooler.

* Place container above all non-ready to eat foods.

Second pH test

CCP

30 minutes after First pH test of the rice recheck pH level and Cool rice to 70^{0}F or below.

* **CCP:** This is the second monitoring step to ensure that the control standard has been reached. The temp and pH of each batch of rice is recorded in the log book.

Holding

Keep the rice temperature at below 70^{0}F

* Food borne illness hazards are controlled or limited.

Remove working portions to make sushi.

Discard left over rice after 12 hours.

HAZARD ANALYSIS WORKSHEET

Firm name: Sushi Avenue Inc

Firm address: 895 Blue Gentian Road Suite#6
Eagan MN 55121

Sushi Bar Location
Location Address _____

Product description: Cooked Brown Sushi Rice

Method of storage and distribution: Store at room temp, in NSF approved container

Intended use and consumer: To be eaten by the general public

1	2	3	4	5	6
Ingredient/ processing step	**Potential Hazards introduced, controlled or enhanced at this step.**	**Are any potential food-safety Hazard (yes/no)**	**Justify your decision for column 3**	**What preventative Measure(s) can be applied to prevent the significant hazards?**	**Is this step a critical control point? (yes/no)**
Receiving	**BIOLOGICAL** **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	No No No	**Biotical**- Low risk product; proper handling & Storage **Chemical**-Use approved chemicals only and proper storage away from food area to prevent **Physical**- Compliance with product specifications. Packaged product.		No
Preparation	**BIOLOGICAL** **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	No No Yes	**Biotical**- Personal hygiene and proper product handling **Chemical**-Use approved chemicals only and proper storage away from food area to prevent **Physical**- Remove foreign objects.	Inspect the rice for physical contaminants and remove if it does not pose a threat to food safety; discard rice if they pose a threat to food safety.	No
Cooking &Seasoning	**BIOLOGICAL** Pathogen growth **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	Yes No No	**Biological**- Cooking rice at 165°F will reduce all vegetative pathogens to safe level. **Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments. **Physical**- Employee vigilance.	Check Rice cooker	No
First pH test	**BIOLOGICAL** Spores of C Bacillus Cereus and C Perfringens **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	Yes No No	**Biotical**- Spores of Bacillus Cereus and C Perfringens. This is the first monitoring step to ensure that the control standard has been reached **Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments. **Physical**- Employee vigilance.	Check the temperature and pH of the rice. A pH level of 4.2 or below must be attained. If proper pH level is not met, add vinegar and run test again. Record in the Temperature & pH log book.	Yes
Second pH test	**BIOLOGICAL** Pathogen growth **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	Yes No No	**Biotical**- Spores of Bacillus Cereus and C Perfringens. This is the second monitoring step to ensure that the control standard has been reached **Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments. **Physical**- Employee vigilance.	The final pH must reach 4.2 or lower to control the Bacillus Cereus. If pH is above 4.2 then rice must be discarded	Yes
Holding	**BIOLOGICAL** Pathogen growth **CHEMICAL** Cleaners and sanitizers **PHYSICAL** foreign objects	Yes No No	**Biotical**- At an increase time, pathogen growth can occur. **Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments. **Physical**- Employee vigilance.	Matain temp below 70°F. Left over rice must be discarded after 12 hours.	No

HACCP PLAN FORM

Firm name: Sushi Avenue, Inc.

Firm address: 895 Blue Gentian Road Suite#6
Eagan, MN 55121

Sushi Bar Location _____

Location Address _____

_____

Product description: Cooked Brown Sushi Rice

Method of storage and distribution: Store at room temp, in NSF approved container

Intended use and consumer: To be eaten without further cooking by general public

Critical Control Point(CCP)	Significant Hazard(s)	Preventive Measure(s)	Monitoring				Corrective Action(s)	Verification	Records
			What	How	Frequency	Who			
First pH test	**Biological** (Spores of Bacillus cereus)	pH ≤ 4.2	pH level	With Hanna brand calibrated pH meter	Every batch	Sushi chef	Incorrect levels requires addition of more vinegar and testing until correct level is reached	Record pH levels in log book Calibrate pH tester log	Review monitoring and corrective action records within one month of preparation
Second pH test	**Biological** (Spores of Bacillus cereus)	pH ≤ 4.2	pH level	With Hanna brand calibrated pH meter	Every batch, 30 minutes after First pH test of the rice	Sushi chef	Discard if pH is above 4.2.	Record pH levels in log book Calibrate pH tester log	Review monitoring and corrective action records within one month of preparation

Signature of Company Official: H.J. KIM

Date: 08/02/2013

Sushi Multi-Grain Rice HACCP Flow Chart

Firm name: Sushi Avenue Inc

Firm address: 895 Blue Gentian Road Suite#6
Eagan MN 55121

Sushi Bar Location
Location Address _____

Receiving

A. Check the physical condition of packaging for physical defects and insect infestation and check the food quality to determine its wholesomeness.

Preparation

Assemble all ingredients and utensils.

* Use of only approved ingredients permitted
* All utensils must be approved, cleaned and sanitized prior to use

Measure 7lbs of rice and 11lbs of water accurately.

Wash rice in cooking pot until water runs clear, drain and add premature water.

* Inspect the rice for physical contaminants and remove if it does not pose a threat to food safety; discard rice if they pose a threat to food safety.

Cooking &Seasoning

Switch rice cooker on and cook rice to a temp of at least 165^{0}F.

* Cooking the rice at high heat will reduce all vegetative pathogens to a safe level. Spores of Bacillus Cereus and C Perfringens will survive.

Empty rice into large NSF approved container and spread rice into a 2" thick even layer.

* Time is too short for any risk.

Measure one Quart seasoning(Sushi Avenue Brand Sushi Seasoning vinegar (acidity 2.9% weight / volume)) and distribute evenly over entire surface of the rice. Run spatula through the rice in a slicing motion, lifting and turning to thoroughly mix in the seasoning.

* The seasoning will reduce pH levels to 4.2 or below of which complies with FDA rules and regulations for food safety. Growth of Bacillus Cereus and C Perfringens will be controlled or limited.

First pH test CCP

Check the temperature and pH of the rice. A pH level of 4.2 or below must be attained. If proper pH level is not met, add vinegar and run test again. Record in the Temperature & pH log book.

* **CCP**: This is the first monitoring step to ensure that the control standard has been reached. The temp and pH of each batch of rice is recorded in the log book.

Once a pH of 4.2 or below is attained, loosely cover container with its lid and place it in the cooler.

* Place container above all non-ready to eat foods.

Second pH test CCP

30 minutes after First pH test of the rice recheck pH level and Cool rice to 70^{0}F or below.

* **CCP**: This is the second monitoring step to ensure that the control standard has been reached. The temp and pH of each batch of rice is recorded in the log book.

Holding

Keep the rice temperature at below 70^{0}F

Food borne illness hazards are controlled or limited.

Remove working portions to make sushi.

Discard left over rice after 12 hours.

HAZARD ANALYSIS WORKSHEET

Firm name: Sushi Avenue Inc
Firm address: 895 Blue Gentian Road Suite#6 Eagan MN 55121
Sushi Bar Location Location Address _____

Product description: Cooked Multi-Grain Sushi Rice
Method of storage and distribution: Store at room temp, in NSF approved container
Intended use and consumer: To be eaten by the general public

1	2	3	4	5	6
Ingredient/ processing step	**Potential Hazards introduced, controlled or enhanced at this step.**	**Are any potential food-safety Hazard (yes/no)**	**Justify your decision for column 3**	**What preventative Measure(s) can be applied to prevent the significant hazards?**	**Is this step a critical control point? (yes/no)**
Receiving	**BIOLOGICAL**	No	**Biotical**- Low risk product; proper handling & Storage		No
	CHEMICAL Cleaners and sanitizers	No	**Chemical**-Use approved chemicals only and proper storage away from food area to prevent		
	PHYSICAL foreign objects	No	**Physical**- Compliance with product specifications. Packaged product.		
Preparation	**BIOLOGICAL**	No	**Biotical**- Personal hygiene and proper product handling	Inspect the rice for physical contaminants and remove if it does not pose a threat to food safety; discard rice if they pose a threat to food safety.	No
	CHEMICAL Cleaners and sanitizers	No	**Chemical**-Use approved chemicals only and proper storage away from food area to prevent		
	PHYSICAL foreign objects	Yes	**Physical**- Remove foreign objects.		
Cooking &Seasoning	**BIOLOGICAL** Pathogen growth	Yes	**Biological**- Cooking rice at 165°F will reduce all vegetative pathogens to safe level.	Check Rice cooker	No
	CHEMICAL Cleaners and sanitizers	No	**Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments.		
	PHYSICAL foreign objects	No	**Physical**- Employee vigilance.		
First pH test	**BIOLOGICAL** Spores of Bacillus Cereus and C Perfringens	Yes	**Biotical**- Spores of Bacillus Cereus, and C Perfringens. This is the first monitoring step to ensure that the control standard has been reached	Check the temperature and pH of the rice. A pH level of 4.2 or below must be attained. If proper pH level is not met, add vinegar and run test again. Record in the Temperature & pH log book.	Yes
	CHEMICAL Cleaners and sanitizers	No	**Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments.		
	PHYSICAL foreign objects	No	**Physical**- Employee vigilance.		
Second pH test	**BIOLOGICAL** Pathogen growth	Yes	**Biotical**- Spores of Bacillus Cereus and C Perfringens. This is the second monitoring step to ensure that the control standard has been reached	The final pH must reach 4.2 or lower to control the Bacillus Cereus. If pH is above 4.2 then rice must be discarded	Yes
	CHEMICAL Cleaners and sanitizers	No	**Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments.		
	PHYSICAL foreign objects	No	**Physical**- Employee vigilance.		
Holding	**BIOLOGICAL** Pathogen growth	Yes	**Biotical**- At an increase time, pathogen growth can occur.	Maintain temp below 70°F Left over rice must be discarded after 12 hours.	No
	CHEMICAL Cleaners and sanitizers	No	**Chemical**-Use of approved chemicals for cleaning and sanitizing food contact surfaces / equipments.		
	PHYSICAL foreign objects	No	**Physical**- Employee vigilance.		

HACCP PLAN FORM

Firm name: Sushi Avenue, Inc.

Firm address: 895 Blue Gentian Road Suite#6
Eagan, MN 55121

Sushi Bar Location _____

Location Address _____

_____

Product description: Cooked Multi-Grain Sushi Rice

Method of storage and distribution: Store at room temp, in NSF approved container

Intended use and consumer: To be eaten without further cooking by general public

Critical Control Point(CCP)	Significant Hazard(s)	Preventive Measure(s)	Monitoring				Corrective Action(s)	Verification	Records
			What	How	Frequency	Who			
First pH test	**Biological** (Spores of Bacillus cereus)	pH ≤ 4.2	pH level	With Hanna brand calibrated pH meter	Every batch	Sushi chef	Incorrect levels requires addition of more vinegar and testing until correct level is reached	Record pH levels in log book Calibrate pH tester log	Review monitoring and corrective action records within one month of preparation
Second pH test	**Biological** (Spores of Bacillus cereus)	pH ≤ 4.2	pH level	With Hanna brand calibrated pH meter	Every batch, 30 minutes after First pH test of the rice	Sushi chef	Discard if pH is above 4.2.	Record pH levels in log book Calibrate pH tester log	Review monitoring and corrective action records within one month of preparation

Signature of Company Official: H.J. KIM

Date: 08/02/2013

White Sushi Rice

Receiving

A. Check the physical condition of packaging for physical defects and insect infestation and check the food quality to determine its wholesomeness.
B. Cooked rice cannot be received by the store, only uncooked rice. All rice must be cooked fresh in the store.
C. Reject loads that do not meet the above criteria; notify the home office immediately.
D. Put sushi rice in the designated sushi area in the dry storage bay.
E. Rotate the delivery to facilitate the first-in-first-out method of stock rotation.

Storing (Dry)

A. Food and food packaging materials must always be kept 6" off the floor to reduce the chance of contamination.
B. Rice must be stored in a clean and dry area.
C. Opened bags of rice must be kept covered or the bag rolled closed at the top to prevent contamination.
D. Scoops with handles must be used to remove the rice from the bag. Do not use cups or utensils without handles.

Personal Hygiene

A. Employees must wash their hands thoroughly. Lather with soap for **at least 20 seconds** prior to sushi preparation.
B. Make sure to use a clean pair of disposable gloves prior to handling any food item.
C. Follow all other policies concerning personal hygiene and employee illness reporting requirements.

Cooking (Old Crop)

A. Clean and sanitize rice cooker prior to use.
B. Measure 7 pounds of U.S. No. 1 Extra Fancy Premium Medium Grain Rice into Zojirushi NYC-36 cooking container.
C. Place Zojirushi NYC-36 cooking container into two compartment vegetable sink and run cold water into the cooking container letting the water overflow.
D. While water is running and overflowing, turn the rice by hand while wearing disposable gloves. Do this until water runs clean.
E. Once water runs clean, drain excess water and measure in 7.5 pounds of water into Zojirushi NYC-36 cooking container.
F. Place Zojirushi NYC-36 cooking container into Zojirushi NYC-36 rice cooker and cook for 45 minutes to a minimum internal temperature of 165°F.
G. Remove rice from cooker and place it in a clean, large, NSF approved plastic container.

Cooking (New Crop)

A. Clean and sanitize rice cooker prior to use.
B. Measure 7 pounds of U.S. No. 1 Extra Fancy Premium Medium Grain Rice into Zojirushi NYC-36 cooking container.

C. Place Zojirushi NYC-36 cooking container into two compartment vegetable sink and run cold water into the cooking container letting the water overflow.
D. While water is running and overflowing, turn the rice by hand while wearing disposable gloves. Do this until water runs clean.
E. Once water runs clean, drain excess water and measure in 8 pounds of water into Zojirushi NYC-36 cooking container.
F. Place Zojirushi NYC-36 cooking container into Zojirushi NYC-36 rice cooker and cook for 45 minutes to a minimum internal temperature of 165°F.
G. Remove rice from cooker and place it in a clean, large, NSF approved plastic container.

Remember: **There are two crops of rice (old and new) depending of the time of year. Be sure to verify which crop you are using; the bags are clearly marked on the front.**

Seasoning

A. Immediately after cooking the rice, add one quart of Sushi Avenue Brand Sushi Seasoning vinegar (acidity 2.9 % weight / volume) to the cooked rice in order to achieve a pH of 4.2 or below.
B. Stir rice thoroughly to ensure sushi seasoning is mixed into all areas.
C. Conduct a pH test (see instructions below). (CCP)
D. If pH is higher than 4.2 add sushi seasoning one cup at a time until pH is at or below 4.2.
E. Once a pH reading of 4.2 or below is reached, loosely cover rice with the container's lid and place the container in the cooler

Remember: **Place the container above all non-ready to eat foods.**
F. Every 15 minutes return to the rice, stir thoroughly and take a temperature reading until rice temperature is 70°F or below.
G. 30 minutes after the first pH test, test again and recheck pH level; discard if pH is above 4.2. (CCP)

Preparation

A. After the rice has reached a temperature of 70°F or below and a pH of 4.2 to 3.7, it is safe to remove the rice from the cooler and store at room temperature.
B. Food preparation must always be done on cleaned, sanitized and approved surfaces using cleaned, sanitized and approved utensils.
C. Wash hands and use clean gloves prior to making sushi.
D. Roll rice onto the sushi rolls using a Bamboo Mat wrapped with clean plastic food film. There should be several mats available and the mats must be changed at least **every 3 hours.**
E. Production using raw sushi fish should be done at the very end of the shift after all other sushi varieties are completed. If fully cooked sushi fish or non-fish items are to be prepared after raw sushi fish, a full sanitization must be performed immediately following preparation using raw sushi fish. This ensures that the raw sushi fish will not contaminate the fully cooked sushi fish and non-fish items.
F. Cooked rice cannot be used for sushi production the next day.
G. Prepare only small batches at a time to ensure freshness and quality; package and display within one hour.

Cooling Sushi

A. Sushi Chefs are responsible for cooling every batch of product to 41 degrees or below.
B. Make sure there is adequate air circulation around the containers.
C. Do not cover until the sushi is cooled, then cover.
D. Do not overload the capacity of refrigeration units, freezer and blast chiller.
E. Put sushi in blast chiller, refrigerator, or freezer for pre-chill to ≤41°F.
F. Use a clean sanitized and calibrated thermometer to check the temperature at the center of the sushi. Make sure that it reaches 41°F within 4 hours.
G. Throw away sushi if the cooling time and temperatures have not been reached.

Displaying Sushi

A. Package sushi for sale in clean, new packaging and display in a refrigerated case that is holding foods to an internal temperature **of 41°F or below.**
B. Do not over fill display case or place food above the load line.
C. Discard packages on display with that have passed their expiration.
D. Check the internal temperature of the displayed sushi **three times daily** to ensure unit is holding temperatures **at 41°F or below.**
E. Notify the store manager or person in charge immediately if improper temperatures are detected at times other than the unit's defrost times. Remove food from the defective unit and place it in another refrigerated unit or discard if temperatures are above 41° F for longer than one hour. Call Facility Maintenance to repair faulty refrigeration units.

Coding & Labeling

A. Label all packaged foods containing rice with a 1-day code from the time of completion.
B. Discard all food items on display that have passed expiration.
C. Label must list all known allergens in the packaged RTE item.

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SUSHI AVENUE SUSHI RICE pH STABILITY STUDY

Introduction

Sushi products with rice, when displayed at room temperature, rely on pH control for safety in order to prevent the germination and growth of *Bacillus cereus* at a pH of 4.2 or less. When acid is added to a food product to stabilize the food, there can be a slight increase over time because of interaction between the acid and food components.

This test was done to verify that the pH never rose above 4.2 during a 12-hour holding period of prepared rice.

Experimental Method

A batch of sushi rice was prepared with 7 lb. of Ichiban Brand U.S. No. 1 Extra Fancy Premium Medium Grain Rice, 8 lb. of water, and 1 cup of Mitsukan MD-43 Sushi Seasoning vinegar, acidity 2.82 to 2.92% weight / volume. The rice pH was measured with a Hanna Instruments H198127 pH meter calibrated in pH 4 and pH 7 buffer. After acidification, the rice was put into a reach-in refrigerator, as per the HACCP procedure, and the pH of the rice was measured at various time intervals for up to 12 hours. This is longer than the rice is held in operation, which is no more than 8:00 a.m. to 6:00 p.m. The experiment was repeated three times.

Results

The results of the three experiments are as follows.

Exp 1		
Time	**pH**	**Temp**
15 m	3.9	120 °F
30 m	3.9	98 °F
60 m	3.9	90 °F
2 h	3.9	72 °F
4 h	4.0	63 °F
6 h	4.0	61 °F
8 h	4.1	60 °F
10 h	4.0	60 °F
12 h	4.0	58 °F
Mean	$\bar{x}$ 3.9	
Stnd dev	σ 0.0707	

Exp 2		
Time	**pH**	**Temp**
15 m	3.8	122 °F
30 m	3.8	99 °F
60 m	3.9	93 °F
2 h	4.1	70 °F
4 h	4.0	66 °F
6 h	3.9	67 °F
8 h	4.0	66 °F
10 h	4.0	64 °F
12 h	4.1	65 °F
Mean	$\bar{x}$ 3.9	
Stnd dev	σ 0.1054	

Exp 3		
Time	**pH**	**Temp**
15 m	4.0	120 °F
30 m	3.9	98 °F
60 m	4.0	90 °F
2 h	3.9	70 °F
4 h	4.0	63 °F
6 h	4.1	61 °F
8 h	4.0	60 °F
10 h	3.9	60 °F
12 h	4.0	58 °F
Mean	$\bar{x}$ 3.9	
Stnd dev	σ 0.060	

Discussion / Conclusion

This experiment shows that the Sushi Avenue HACCP recipe and ingredients produce a stable sushi rice that maintains a safe pH of less than 4.2 for at least 12 hours after production. Because the sushi products are sold refrigerated at 41°F, there is actually redundant hazard control, pH less than 4.2 and temperature at or below 41°F, and the process is safe and stable.

O. Peter Snyder Jr.

O. Peter Snyder, Jr., Ph.D.
Process Authority
December 18, 2007

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VALIDATION OF SAFE ACIDIFICATION OF MULTI-GRAIN AND BROWN SUSHI RICE

Introduction

A critical control in the production and selling of sushi is to include vinegar in the rice so that *Bacillus cereus* cannot multiply if the sushi is sold at room temperature. In the past, it was believed that it took a pH of 4.3 to assure the prevention of *B. cereus* growth in rice at room temperature. Actually, new research shows that the pH is 5.0 or higher (Snyder, 2009).

Another variable for assuring the safety of rice is the concern with the elevation of pH because of protein equilibration of some of the acid with rice protein.

In order to assure the safety of the rice being served at Sushi Avenue, a test was run to determine the pH and stability of multi-grain and brown rice after addition of the acid and to find out how much the pH shifted over a period of 12 hours.

Method

Sushi Avenue's standard white rice recipe, found in Sushi Avenue's HACCP manual, was used for this experiment with minor water variation. Han River brand multi-grain rice and Nishiki medium-grain brown rice were used instead of white rice. Thirteen lb. of water were used to cook the 7 lb. of multi-grain rice, and 12 lb. of water were used to cook the 7 lb. of brown rice. One quart of Han River flavored vinegar was used for acidification of both the multi-grain and brown rice. The experiment was repeated three times.

Results

Table 1 shows the pH stability of the multi-grain rice over a period of 12 hours of cooking, and Table 2 shows the pH stability of the brown rice over a period of 12 hours of cooking. The pH increased no more than 0.3 of a pH unit. The highest pH was 4.1. From a safety perspective, the pH is extremely safe, and there is no chance of *B. cereus* growth if the rice is left at room temperature.

Table 1. pH stability of multi-grain rice

Experiment 1			Experiment 2			Experiment 3		
Time	pH	Temp	Time	pH	Temp	Time	pH	Temp
15 min	3.8	135°F	15 min	3.8	128°F	15 min	3.8	125°F
30 min	3.8	110°F	30 min	3.8	105°F	30 min	4.0	105°F
60 min	3.9	90°F	60 min	3.9	91°F	60 min	3.9	9°F
2 hr	3.8	68°F	1 hr	3.9	68°F	1 hr	3.9	70°F
4 hr	3.9	67°F	4 hr	4.0	65°F	4 hr	4.0	65°F
6 hr	3.8	61°F	6 hr	3.9	63°F	6 hr	4.0	64°F
8 hr	3.9	60°F	8 hr	3.9	61°F	8 hr	3.9	61°F
10 hr	4.0	55°F	10 hr	3.9	58°F	10 hr	3.9	62°F
12 hr	4.0	57°F	12 hr	4.0	55°F	12 hr	4.0	53°F

Table 2. pH stability of brown rice

Experiment 1			Experiment 2			Experiment 3		
Time	pH	Temp	Time	pH	Temp	Time	pH	Temp
15 min	3.9	130°F	15 min	3.8	135°F	15 min	3.8	131°F
30 min	4.0	100°F	30 min	3.9	105°F	30 min	3.9	101°F
60 min	4.1	85°F	60 min	4.0	88°F	60 min	4.1	91°F
2 hr	4.1	70°F	1 hr	4.1	68°F	1 hr	4.1	70°F
4 hr	4.1	63°F	4 hr	4.1	63°F	4 hr	4.1	64°F
6 hr	4.0	60°F	6 hr	4.1	61°F	6 hr	4.0	66°F
8 hr	4.0	62°F	8 hr	4.0	58°F	8 hr	4.0	60°F
10 hr	4.0	58°F	10 hr	4.0	57°F	10 hr	4.0	62°F
12 hr	4.0	59°F	12 hr	4.0	55°F	12 hr	4.0	54°F

Conclusions and recommendations

This experiment has shown that multi-grain rice and brown rice can be treated in the same way as white rice for the production of sushi. The pH equilibrium of the rice is not significantly affected by the protein in the rice, and the cooked multi-grain rice and brown rice are very stable products that can be stored at room temperature with no hazard.

O. Peter Snyder Jr.

O. Peter Snyder, Jr., Ph.D.
PROCESS AUTHORITY
July 28, 2009

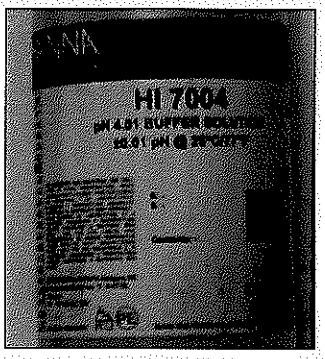
Reference;

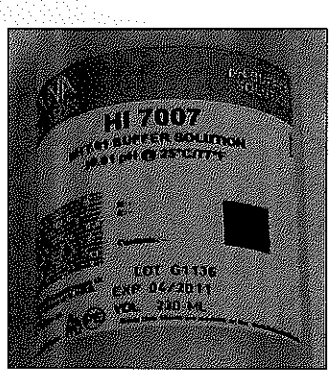
Snyder, O.P. 2009. Control of *Bacillus cereus* in sushi rice by acid. Hospitality Institute of Technology and Management. St. Paul, MN

HOW TO CALIBRATE HANNA INSTRUMENTS pH TESTER
pH ပမာဏတိုင်းသည့် ကိရိယာ၏ တိကျမှန်ကန်မှု ရှိ/မရှိကို စမ်းသပ်စစ်ဆေးခြင်း

Calibration is required daily before using or if tester is dropped or mishandled
❖❖ *pH* ပမာဏတိုင်းသည့် ကိရိယာကို လိုအပ်ချက်အရ အသုံးမပြုမီ တနေ့လျှင်တကြိမ် ပုံမှန်စစ်ဆေးရန်၊
(သို့မဟုတ်) ပမာဏတိုင်းသည့် ကိရိယာ လက်မှလွတ်ကျခြင်း (သို့မဟုတ်) မှားယွင်းစွာ ကိုင်တွယ်တိုင်းတာမိခြင်း။

Items needed:
လိုအပ်သည့် ပစ္စည်းများ



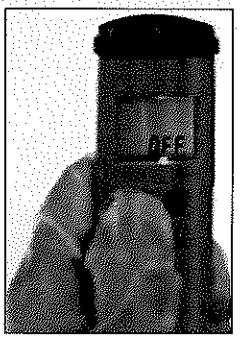


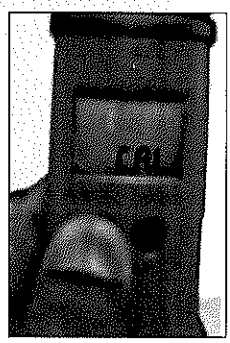
Hanna Instruments pH tester
pH ပမာဏတိုင်းသည့် ကိရိယာ
Two serving cups
စမ်းသပ်ဆေးရည်ထည့်ရန် ခွက်ငယ် (၂)ခွက်
pH 7.0 buffer solution
pH 7.0 စမ်းသပ်ဆေးရည် (၁)ဗူး
pH 4.0 buffer solution
pH 4.0 စမ်းသပ်ဆေးရည် (၁)ဗူး

1. Obtain all necessary items.
၁) လိုအပ်သည့် ပစ္စည်းကိရိယာအားလုံးကို ဆောင်ထားရမည်။

2. Verify expiration date on buffer solutions has not passed.
၂) *pH 7.0* စမ်းသပ်ဆေးရည်ဗူးနှင့် *pH 4.0* စမ်းသပ်ဆေးရည်ဗူး(၂)ဗူးစလုံး၏ သက်တမ်းကုန်ဆုံးသည့်ရက်စွဲကို သေချာအောင် စစ်ဆေးရမည်။

3. Fill one serving cup with 4.0 buffer solution and the other with 7.0 solution.
၃) *pH 7.0* စမ်းသပ်ဆေးရည်ဗူးထဲမှ အရည်အနည်းငယ်ကို ခွက်တခုထဲ၌ထည့်၍ *pH 4.0* စမ်းသပ်ဆေးရည် အနည်းငယ်ကို အခြား ခွက်တခုထဲ၌ ထည့်ရမည်။

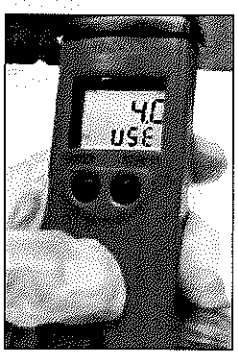


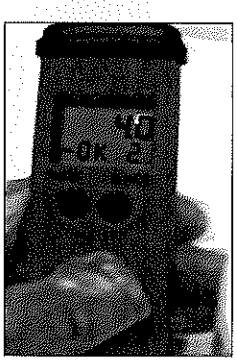


4. Press and hold mode button until "CAL" is displayed.
၄) တိုင်းတာသည့်ကိရိယာဒိုင်ခွက်၌ ***"CAL"*** ဟူသည့် စာလုံးပေါ်လာသည်အထိ လက်ဝဲဘက်ရှိ ⏻ **MODE** ခလုတ်ကို **"ဖွင့်"**ထားရမည်။
(**CAL** ဟူသည့် စာလုံးမပေါ်မီ **OFF** ဟူသည့် စာလုံး ဦးစွာပေါ်လာမည်။
ဤခလုတ်ကို **အဆက်မပြတ် ဖွင့်ထားရမည်။** သို့မှသာ **CAL** စာလုံးပေါ်လာမည်။
ထိုစာလုံးပေါ်လာပါက ဖွင့်ထားသည့် ⏻ **MODE** ခလုတ်ကို လွှတ်လိုက်ရမည်။)

5. Dip electrode into pH 7.0 buffer solution.
၅) တိုင်းတာသည့် ကိရိယာထိပ်ဖျားကို *pH 7.0* စမ်းသပ်ဆေးရည်ထည့်ထားသည့် ခွက်ထဲသို့ နှစ်လိုက်ရမည်။

6. Hold electrode in pH 7.0 buffer solution until screen displays "4.0 USE".
၆) တိုင်းတာသည့်ကိရိယာဒိုင်ခွက်၌ ***4.0 USE*** စာလုံးပေါ်လာသည်အထိ ကိုင်ထားရမည်။ ဤစာလုံးပေါ်လာသည်နှင့် ယင်းခွက်ထဲမှ ထုတ်လိုက်ရမည်။





7. Dip electrode into pH 4.0 buffer solution.

၇) တိုင်းတာသည့်ကိရိယာကို *pH 4.0* စမ်းသပ်ဆေးရည်ထည့်ထားသည့် ခွက်ထဲသို့ နှစ်ထားရမည်။

8. Hold electrode in pH 4.0 solution until screen displays "OK".
၈) တိုင်းတာသည့်ကိရိယာဒိုင်ခွက်၌ ***OK*** စာလုံးပေါ်လာသည်အထိ ခွက်ထဲ၌ နှစ်ထားရမည်။

tester will automatically return to normal mode when accepted
❖❖ အသုံးပြု၍ ရနိုင်သည့် အဖြေရရှိပါက ပုံမှန်အနေအထားသို့ အလိုအလျောက် ပြန်လည်ရောက်ရှိနေပြီဖြစ်ကြောင်း တိုင်းတာသည့်ကိရိယာဒိုင်ခွက်၌ တွေ့မြင်ရမည်။

9. Remove and rinse electrode.
၉) ထိုအခါ ခွက်ထဲ၌နှစ်ထားသည့် တိုင်းတာသည့်ကိရိယာကို ပြန်လည်ထုတ်ယူ၍ ဆေးကြောရမည်။

10. Return protective cover with required amount of pH 7.0 buffer solution inside cover.
၁၀) ကိရိယာကို ပြန်လည်မဖုံးအုပ်မီ အဖုံးအတွင်း၌ pH 7.0 စမ်းသပ်ဆေးရည် အနည်းငယ်ထည့်ပေးရမည်။

only a few drops are required to keep electrode moist
❖❖ pH 7.0 စမ်းသပ်ဆေးရည်ကို အစက်အနည်းငယ်သာ ထည့်ပေးရန် လိုအပ်ပါသည်။

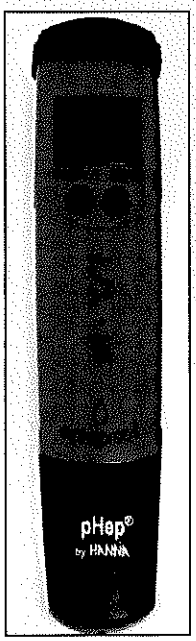
11. Record date and time in notes section of pH log book.
၁၁) စစ်ဆေးသည့် ရက်စွဲ၊ အချိန်နှင့် ရရှိသည့်အဖြေကို မှတ်တမ်းစာအုပ် ***(pH log book)*** ထဲ၌ တိတိကျကျ ရေးမှတ်ထားရမည်။

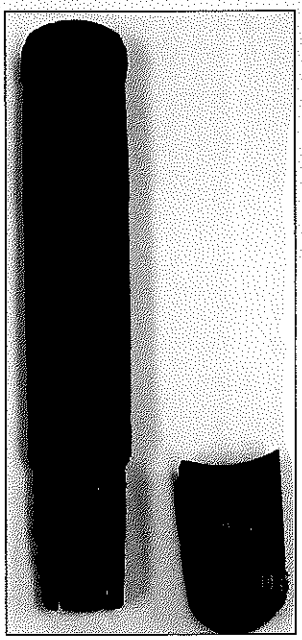
SUSHI BROWN RICE pH, TEMPERATURE AND pH TESTER CALIBRATION LOG SHEET

ACCOUNT:
LOCATION:
pH TESTER MUST BE CALIBRATED EVERYDAY
EVERY BATCH OF BROWN RICE COOKED MUST BE pH TESTED
1st reading taken right mixing in the vinegar — 2nd reading taken 30 minutes after the first reading
DOCUMENT ANY CORRECTIVE ACTIONS TAKEN ON THE HACCP CA FORM QA-001

DATE	White/Brown or Multi Grain Rice	IS pH TESTER CALIBRATED	1st TIME READING	1st pH	1st TEMP	BY WHO	2nd TIME READING	2nd pH	2nd TEMP	BY WHO
11/16/2009	White Rice	YES	8:15AM	4.0	185°F	BW	8:45AM	3.9	95°F	BW
11/16/2009	Brown Rice	YES	9:30AM	4.0	185°F	TR	10:00 AM	4.0	99°F	TR
11/16/2009	Multi Grain Rice	YES	12:30PM	4.1	185°F	JMF	1:00PM	4.1	101°F	JMF
					°F				°F	
					°F				°F	

"လိုအပ်သည့် ပစ္စည်းများ"



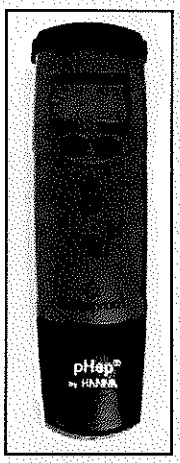


HOW TO TEST THE pH OF SUSHI RICE

ဆူရှီဆန်တဲ၌ ပါဝင်သည့် **pH** ပမာဏကို မည်သို့စမ်းသပ်စစ်ဆေးမည်နည်း

Items needed:

လိုအပ်သည့် ပစ္စည်းများ
Hanna Instruments pH tester
pH တိုင်းတာသည့် ကိရိယာ
Distilled water
သောက်ရေသန့်
Small container
ထမင်းဖျော့ရန် ဇလုံငယ်
Log book
မှတ်တမ်းစာအုပ်
Two 2 oz serving cups
နှစ်အောင်စခွက် (၂) ခွက်
Chopsticks
တူ (၁) စုံ
Log book
မှတ်တမ်းစာအုပ်
Writing utensil
စာရေးကိရိယာများ

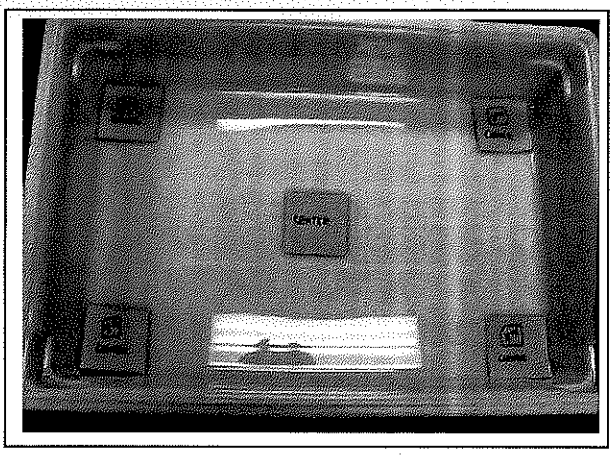


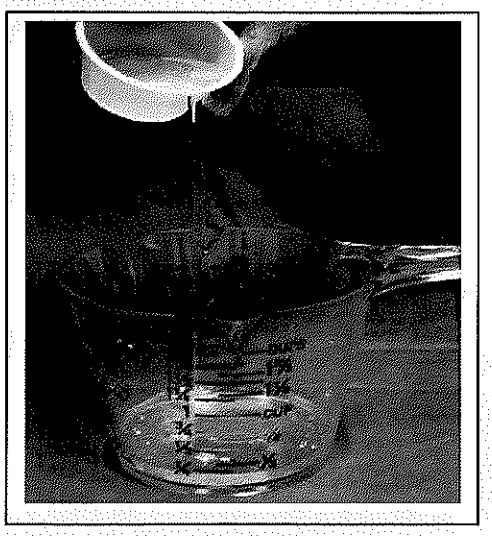
SUSHI BROWN RICE pH, TEMPERATURE AND pH TESTER CALIBRATION LOG SHEET

ACCOUNT:										
LOCATION:										
pH TESTER MUST BE CALIBRATED EVERYDAY										
EVERY BATCH OF BROWN RICE COOKED MUST BE pH TESTED 1st reading taken right mixing in the vinegar — 2nd reading taken 30 minutes after the first reading										
DOCUMENT ANY CORRECTIVE ACTIONS TAKEN ON THE HACCP CA FORM QA-001										
DATE	White/Brown or Multi Grain Rice	IS pH TESTER CALIBRATED	1st TIME READING	1st pH	1st TEMP	BY WHO	2nd TIME READING	2nd pH	2nd TEMP	BY WHO
11/16/2009	White Rice	YES	09:15 AM	3.9	165°F	SW	9:45AM	3.9	95°F	SW
11/16/2009	Brown Rice	YES	11:30AM	4.0	168°F	TR	12:00 AM	4.0	99°F	TR
11/16/2009	Multi Grain Rice	YES	12:30PM	4.1	166°F	JMF	1:00PM	4.1	101°F	JMF
					°F				°F	
					°F				°F	

1. Collect in one serving cup a sample of seasoned sushi rice from all four corners and the center of the ingredient bin by pinching a small amount of the rice between your thumb, forefinger and middle finger.

၁) ဗင်နီဂါနှင့် သမထားပြီးသည့် ဆူရှီထမင်းအနည်းငယ်ကို ဇလုံထောင့် (၄)ထောင့်နှင့် အလယ်ဗဟိုနေရာတို့မှ နှိုက်ယူရမည်။





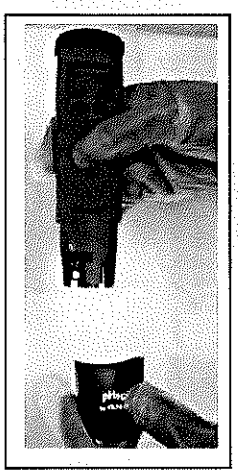
2. Empty collected rice into small container.

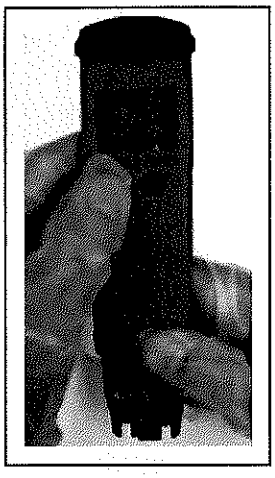
၂) ရယူထားသည့် ဆူရှီထမင်းကို ဇလုံအလွတ်တလုံးထဲသို့ ထည့်ရမည်။

3. Fill second serving cup with distilled water and empty it into the small container.

၃) ကျန် နှစ်အောင်စခွက်ထဲသို့ ရေသန့်အနည်းငယ်ထည့်၍ ထမင်းထည့်ထားသည့် ဇလုံထဲသို့ လောင်းထည့်ပါ။

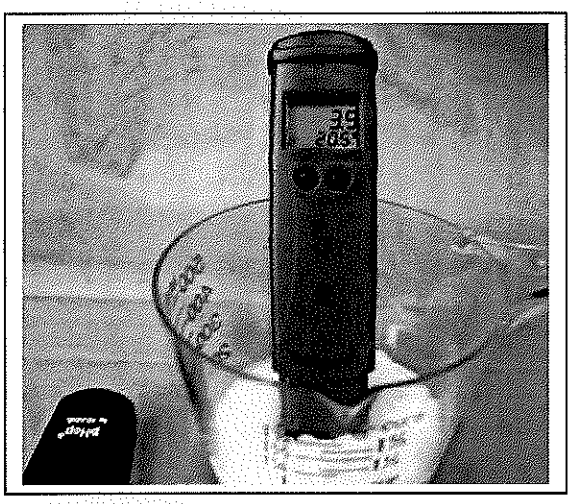
4. Stir slowly and thoroughly with chopsticks for 10-20 seconds.
၄) ဖြည်းဖြည်းနှင့် နှံ့အောင် တူတဆောင်းဖြင့် ၁၀-၂၀ စက္ကန့်မျှ မွှေပါ။





5. Remove cover from electrode assembly and turn the tester to the on position.
၅) စမ်းသပ်ကိရိယာ၏ ထိပ်ဖျားရှိ အဖုံးကိုဖြုတ်ပြီး ဖွင့်/ပိတ် ခလုတ်ကိုနှိပ်၍ စမ်းသပ်ကိရိယာကို ဖွင့်လိုက်ပါ။

6. Dip the electrode 1/2" to 1" into the test solution, stir once and wait for reading to stabilize.
၆) စမ်းသပ်ဆေးရည်ထဲသို့ စမ်းသပ်ကိရိယာထိပ်ဖျားအား လက်မဝက် (သို့) တလက်မခန့် နစ်မြုပ်အောင် ထည့်ထားပါ။ တကြိမ်ခန့်ထပ်မွှေ၍ ဒိုင်ခွက်၌ ဂဏန်းများ ငြိမ်သွားသည်အထိ ခေတ္တစောင့်ပါ။



7. Note the pH.
၇) pH ပမာဏကို မှတ်သားပါ။

8. Record and initial in the log book.
၈) ရရှိသည့် pH ပမာဏအား မှတ်တမ်းစာအုပ်၌ ရေးမှတ်ပါ။

9. Rice must be tested at least two times per batch, once right after cooking and mixing with vinegar, and then again about 30 minutes after the first pH reading.
၉) ထမင်းတအိုးလျှင် အနည်းဆုံး (၂)ကြိမ် စမ်းသပ်ရမည်။ တနေ့တာအချိန်အတွင်း ထင်းချက်ပြီးပြီးခြင်းနှင့် ချက်ပြီးနောက် နာရီဝက်ခန့်အကြာ၌ စမ်းသပ်ရမည်။

အထူးအရေးအကြီးဆုံးအချက်မှာ ချင်တွယ်ခွက်ထဲသို့ ထည့်ရမည့် ရေသန့် (၅)အောင်စသည် သီးသန့်ဝယ်ယူထားသည့် သောက်ရေသန့် Distill Water ဖြစ်ရမည် ဖြစ်ပါသည်။ (ပိုက်လိုင်းမှလာနေသည့်ရေကို လုံးဝအသုံးမပြုရပါ။ ပိုက်လိုင်းမှရေကို အသုံးပြုပါက မှန်ကန်သည့် pH ပမာဏကို ရရှိနိုင်မည်မဟုတ်ပါ။

SUSHI RICE pH, TEMPERATURE AND pH TESTER CALIBRATION LOG SHEET

ACCOUNT:

LOCATION:

pH TESTER MUST BE CALIBRATED EVERYDAY

EVERY BATCH OF RICE COOKED MUST BE pH TESTED

1st reading taken right mixing in the vinegar **2nd reading taken 30 minutes after the first reading**

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11/16/2009	Brown Rice	YES	9:30 AM	4.0	168°F	TR	10:00 AM	4.0	105°F	TR
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					°F				°F	
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SUSHI RICE pH, TEMPERATURE
AND pH TESTER CALIBRATION LOG SHEET

ACCOUNT:

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