FOR OFFICE USE ONLY

DATE RECEIVED: ***1/02/2024*** *DATE APPROVED:* ***1/05/2024***

FILE NUMBER: ***#24-001***

APPLICATION FOR STATISTICAL CONSULTING

LAST NAME**:** Martin FIRST NAME: Joshua

DEPARTMENT (full name): Food Science CAMPUS MAILING ADDRESS: Nelson

PHONE: 716-545-0276 EMAIL ADDRESS: mart1543@purdue.edu

YOUR PRIMARY POSITION AT PURDUE: Staff

Other:

(if a student) MAJOR PROFESSOR LAST NAME: FIRST NAME:

PHONE NUMBER:

MAJOR PROFESSOR CAMPUS ADDRESS (BLDG & DEPT): /

MAJOR PROFESSOR EMAIL:

HOW DID YOU FIND US: Recommendation of a colleague

LIST STATISTICS COURSES TAKEN AND STATISTICAL COMPUTING EXPERIENCE: STAT 305, some experience with anova in food science course work, little to no software experience

STAGE OF RESEARCH: Design (no data collected yet)

IF DESIGN STAGE IS COMPLETE, WAS A STATISTICIAN CONSULTED FOR DESIGN?

PREVIOUS CONSULTANT – INSTITUTION/DEPARTMENT:

ESTIMATED NUMBER OF CONSULTING HOURS NEEDED THIS SEMESTER: <5 hours

EXPECTED COMPLETION DATE OF PROJECT: 2/19/2024

IMPORTANT DEADLINE OR DUE DATES RELATED TO YOUR PROJECT:

THE RESULTS OF THIS RESEARCH WILL PROBABLY BE PUBLISHED AS:

Other Industry Partnership

IS THIS RESEARCH SUPPORTED BY A GRANT OR CONTRACT? No

If so, give grant/contract title:

GIVE A BRIEF DESCRIPTION OF YOUR RESEARCH INCLUDING:

PURPOSE: Technically, our project is under an NDA, so I won't be too specific about the company we are working with or the product. I'll just explain what's relevant to the help we'd need. Our goal is to determine the effectiveness of an antimicrobial in controlling the growth of a certain type of Listeria monocytogenes within our partner's product.

DESCRIPTION OF VARIABLES TO BE MEASURED: We are studying the growth of bacteria in a food matrix over the course of a couple of weeks. To start the study, we will take the food samples and inoculate them with the bacteria. There will be 3 levels of antimicrobial concentration in the food matrix, and 3 replicates per level. We will store the inoculated food in an incubator and observe the growth of bacteria by aseptically removing a portion of the food every 3-4 days and putting it onto growth media to get a CFU/g. We would like to average the replicate data points so that we have a number that represents each day and level. 6 sampling days * 3 levels = 18 data points to analyze.

Previously, a PhD student did statistical analysis for this partnership for previous projects. He has become too bust for this project and is passing it off to us to find some other way to analyze the data. Here's what he wrote about it:

"Statistical analysis was conducted using JMP Pro 16 (JMP statistical discovery Cary, NC). After normal distribution fit assessment, analysis of variance ANOVA was implemented to evaluate the effect of the different treatments on the concentration of L. monocytogenes on the product. Consequently, a comparison was performed by using Tukeyâ€™s Test to evaluate the differences for the Listeria concentration among treatments for each sampling day, as well as the comparison with day zero."

So we would have 18 data points, and we'd just like your help to determine which points are significantly different from which other points. Also, if possible, I'd like to understand how to do this myself so I can do it in the future.

RESEARCH QUESTIONS THAT YOU WANT TO ADDRESS USING STATISTICAL METHODS: What is the effect of adding increased levels of antimicrobial to our partner's product on L. monocytogenes growth?

STATISTICAL ISSUES: How can I perform this analysis in the future myself?

ADDITIONAL INFORMATION YOU THINK WOULD BE HELPFUL:

ATTACHMENTS: None