UNIVERSITY OF HELSINKI
FACULTY OF VETERINARY MEDICINE

SOLUTION FOR EXERCISE 1 – MILK QUALITY

1. Import database to SPSS

Command:

File … Open … Data … chose file from the new window … select Excel (*.xls, *.xlsx, *.xlsm) from the Files of type … click Open

Read Excel File … chose Worksheet "ATP" … click OK

2. Define each of the variables – DEFINE VARIABLE PROPERTIES

Command:

Data … Define Variable Properties … chose Variable and move to Variables to Scan … click Continue

Complete: Label, Measurement level, Type, Width, and Decimals. Mark Missing if any value means NO INFORMATION AVAILABLE.

3. Recode and define Bacterial count into a Categorical Variable

Command:

Transform … Recode into Different Variables … select BC … click Old and New Values …

4. Describe the data and its distribution. Check for normality and homogenicity of variance

Command:

Analyze … Descriptive Statistics … Frequencies … select the variables … click Statistics … select Std. deviation, Minimum, Maximum, Mean … click OK

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Frequencies

Statistics

		type of milking system	chlorinated water	Use of acid detergent	LRU in teat cup rubbers	LRU in teat dip containers	LRU in milk receivers	LRU in pipeline joints	bacterial count in bulk tank milk
N	Valid	106	106	99	106	84	52	23	94
	Missing	0	0	7	0	22	54	83	12
Std. Deviation		,704	,465	,978	813,092	9662,489	10971,470	17747,918	139,409
Minimum		1	0	0	8	0	0	2	10
Maximum		3	1	3	5000	79000	69000	77000	564

Command:

Analyze … Descriptive Statistics … Explore … select the variables … click Plots … click Normality plots with tests … click Display Both … click OK

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LRU in teat cup rubbers	,249	19	,003	,628	19	,000
LRU in teat dip containers	,443	19	,000	,314	19	,000
LRU in milk receivers	,359	19	,000	,399	19	,000
LRU in pipeline joints	,329	19	,000	,551	19	,000

a. Lilliefors Significance Correction

5. Anova or Comparison of several means

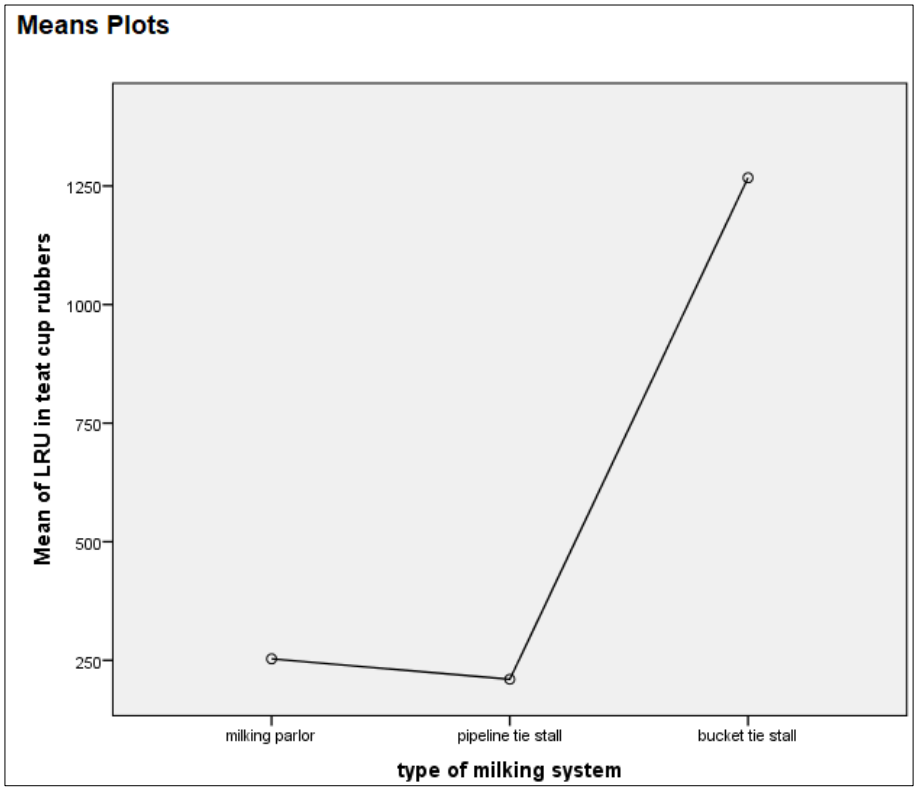
Compare the mean values of LRU in different surfaces by Type of milking system and by Use of acid detergent

Command:

Analyze … Compare Means … One-Way ANOVA … select Dependent List - variables LRU … select Factor: Milk system … click Options … select Means Plot … click Continue … click OK

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
LRU in teat cup rubbers	Between Groups	12140673,47	2	6070336,735	10,916	,000
	Within Groups	57276835,67	103	556085,783		
	Total	69417509,14	105			
LRU in teat dip containers	Between Groups	267336288,0	2	133668144,0	1,447	,241
	Within Groups	7481850049	81	92368519,12		
	Total	7749186337	83			
LRU in milk receivers	Between Groups	14663901,29	1	14663901,29	,120	,731
	Within Groups	6124366760	50	122487335,2		
	Total	6139030661	51			



6. Regression analysis

Relationship between LRU data and bacterial count in bulk tank milk

Command:

Analyze … Regression … Linear … select Bacterial count as Dependent … select LRU variables as Independent(s) … click OK

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,427[a]	,183	-,051	152,115

a. Predictors: (Constant), LRU in pipeline joints, LRU in teat cup rubbers, LRU in teat dip containers, LRU in milk receivers

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	138,185	49,944		2,767	,015
	LRU in teat cup rubbers	,353	,298	,293	1,185	,256
	LRU in teat dip containers	-,004	,004	-,225	-,886	,391
	LRU in milk receivers	-,004	,004	-,230	-,885	,391
	LRU in pipeline joints	,000	,002	,016	,060	,953

a. Dependent Variable: bacterial count in bulk tank milk

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