Statistics in MS Excel – Model Examples II

Example 1:

In a stock of dairy cows the effect of new veterinary preparation on the AST activity in blood serum of dairy cows has been monitored. In 10 dairy cows (control ones), to which the preparation was not applied, the following AST activities in blood serum have been found (in $\mu mol.l^{-1}$):
0.337, 0.302, 0.405, 0.400, 0.381, 0.398, 0.377, 0.392, 0.345, 0.409
In 10 dairy cows (test ones), to which the preparation was applied. the following AST activities in blood serum have been found (in $\mu mol.l^{-1}$):
 0.341, 0.302, 0.504, 0.452, 0.309, 0.375, 0.479, 0.423, 0.311, 0.333
Does the preparation influence the variance of AST activity in blood serum of dairy cows?

Example 2:

In a horse farm the effect of energy preparation on the glucose level in blood serum of horses was tested. In 10 horses (control), to which the preparation was not apllied, the following glucose levels in blood serum were measured (in $mmol.l^{-1}$):

3.1, 2.7, 3.3, 3.1, 3.1, 3.2, 3.0, 2.8, 2.9, 2.7

In 10 horses, to which the preparation was applied the following glucose levels in blood serum were measured (in $mmol.l^{-1}$):

3.2, 2.7, 2.7, 3.3, 3.2, 3.3, 3.7, 3.9, 3.1, 3.5

Does the preparation influence the glucose level in blood serum of horses?

Example 3:

The effect of light regime on egg weight in layers has been monitored. In usual light regime the egg weights in high-density farm has been observed – in randomly chosen 10 layers the following values (g) have been found:

37, 35, 38, 42, 35, 38, 39, 36, 40, 37.
Afterwards the light regime in high-density farm was adjusted so that to achieve the higher lay-down (for the same time period). In the same 10 layers the eggs have been weigh again and the following values of egg weights have been found (g):

36, 38, 35, 40, 37, 36, 38, 35, 38, 37.

Did the light regime change influence the egg weight?

Example 4:

Find out whether a correlation between Mg level in urine and pH of urine exists in dairy cows. In an experiment, following values were measured:

Mg (mmoll^{-1})	pH (-log H$^+$)
8.2	7
16.4	8.2
7.3	6.5
12.9	7.8
6.9	7.7
14.5	8.3
17.3	8.1
8.2	7.1
12.3	8
13.3	7.5
10.2	7.5

Find out wheather a correlation between these data exists and figure a chart of linear regression (with a trendline equation) of the relation.

Work out a protocol in Word (Excel) that will contain:

- Table of primary data in the samples
- Calculated basic statistical characteristics: average, SD, SEM of each sample
- **For Examples 1-3:**
  - Calculated probability of F-test or *t*-test (what is appropriate for the example).
  - Conclusion (answer)
  - Column chart of samples data: AVGs + error bars (SEM)

  For Example 4:

  - Calculated correlation coefficient and the chart of linear regression (with a trendline equation) of the relation between sample data.