



## Comparison of the nootropic effect of Ecuadorian linseed oil and powder (*Linum usitatissimum*) on *Mus Musculus* mice

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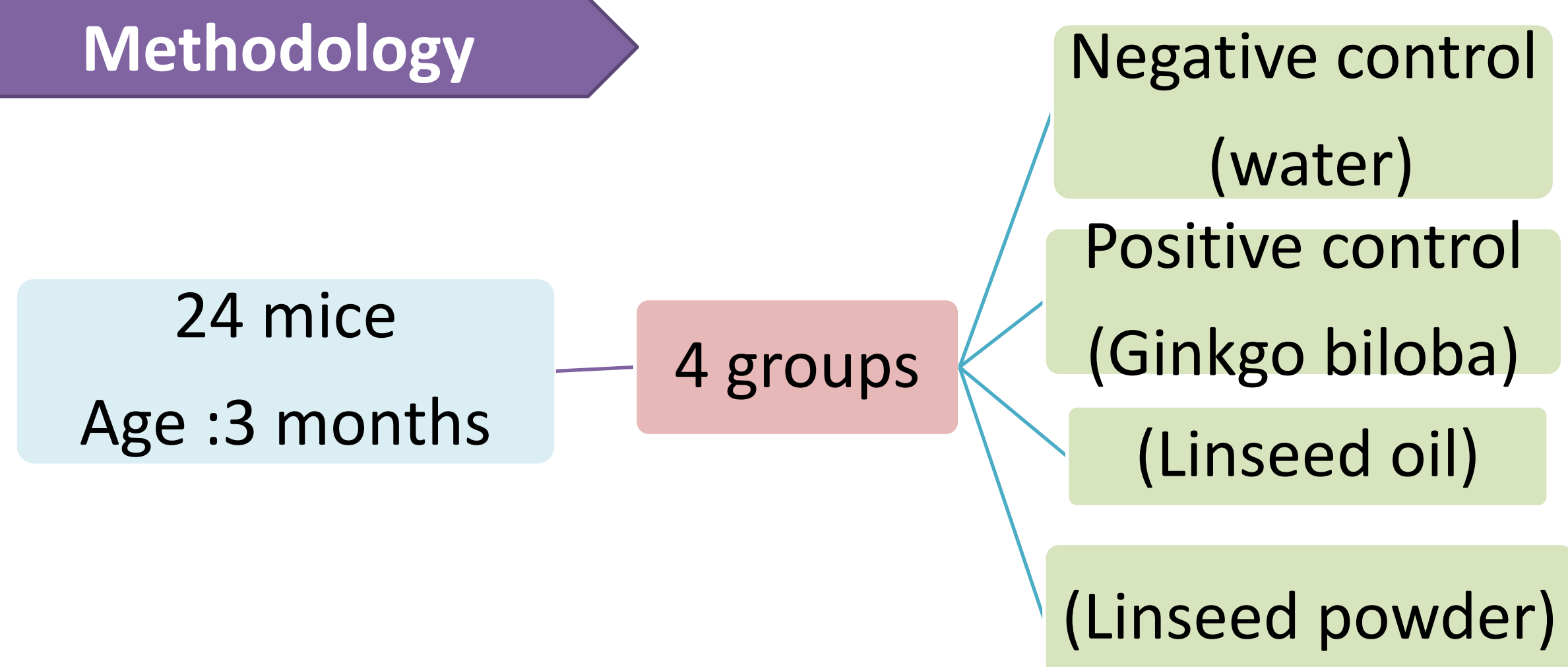
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**Introduction:** There are studies have shown that the fatty acid (omega 3) exerts a neuroprotective effect protecting the biological membranes from their oxidation, reducing the neurodegenerative process.

**Objetive :** To compare the nootropic effect of oil and powder from Ecuadorian linseed (*Linum usitatissimum*) in *Mus musculus* mice.

### Methodology



### TREATMENTS

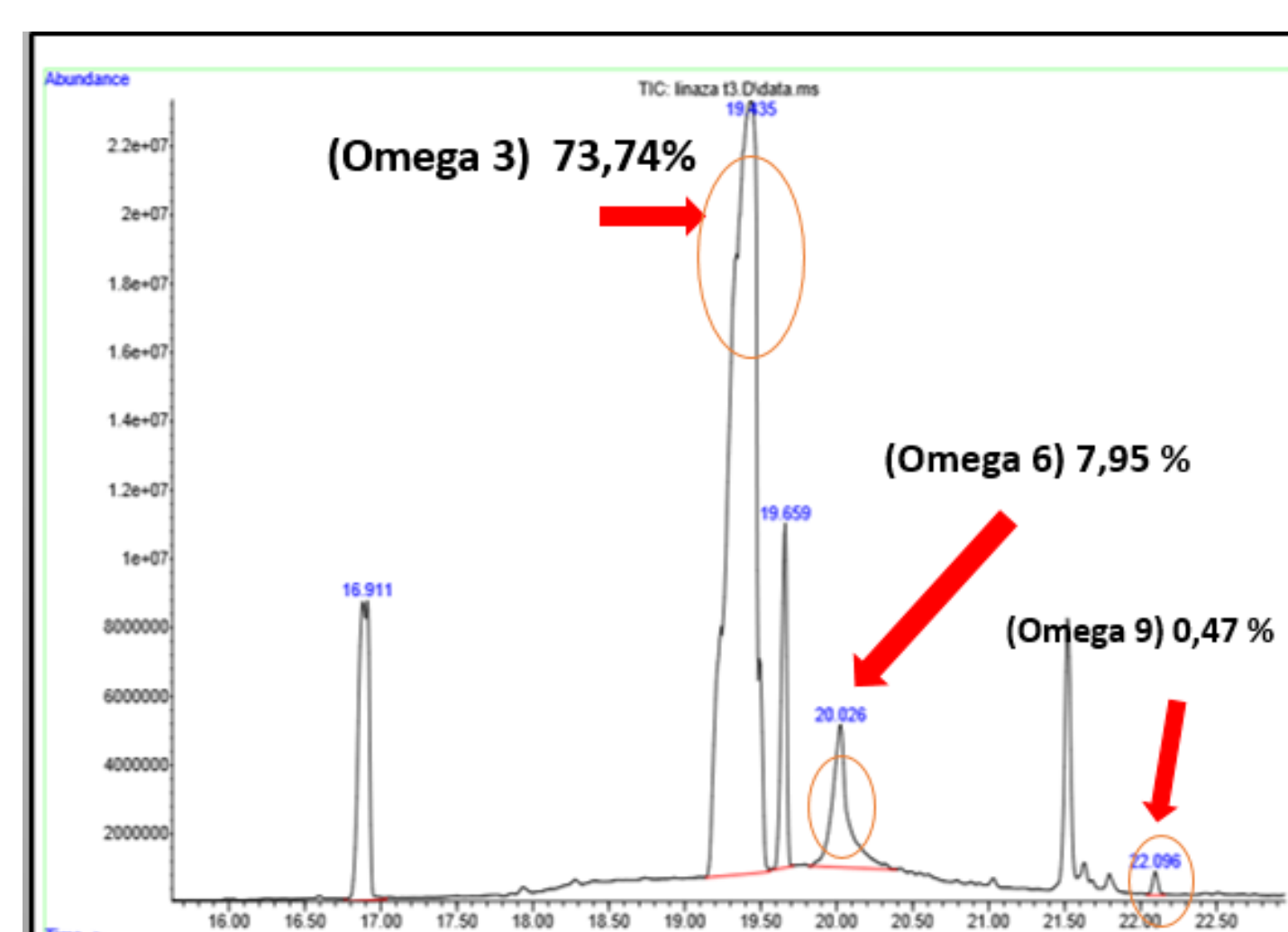


### EXPERIMENTATION MODEL



TRAINING / EVALUATION

Figure 1. The most abundant fatty acid present in linseed seeds was alpha linoleic acid (omega 3)



### Results

Table 1: ANOVA

Factors	Sum of Square	Degrees of Freedom	Mean Sum of square	F. calculat ed	Critical value of F. Tab 5 %	Critical value of F. Tab 1 %
Total	973,2	55				
sex	5,01	1	5,01	0,62 ns	4,17	7,56
Treatments	750,94	27	27,81	3,45 **	1,79	2,3
Groups	232,8	3	77,6	9,64 **	2,92	4,51
days	333,9	6	55,65	6,91 **	2,42	3,47

There is a significant difference when F. calculated > F. Critical value. The differences between treatments, groups and the evaluation days it does not depend on the sex of the mice.

### Morris Water Maze

Duncan test at 5% for the group factor

Groups	Mean	Duncan
Negative control	14,12	A
Ginkgo biloba	10,34	B
Linseed oil	9,39	B
Linseed powder	8,94	B

Linseed oil and linseed powder groups took a statistically shorter time to find the goal and these are also equivalent to the ginkgo biloba group

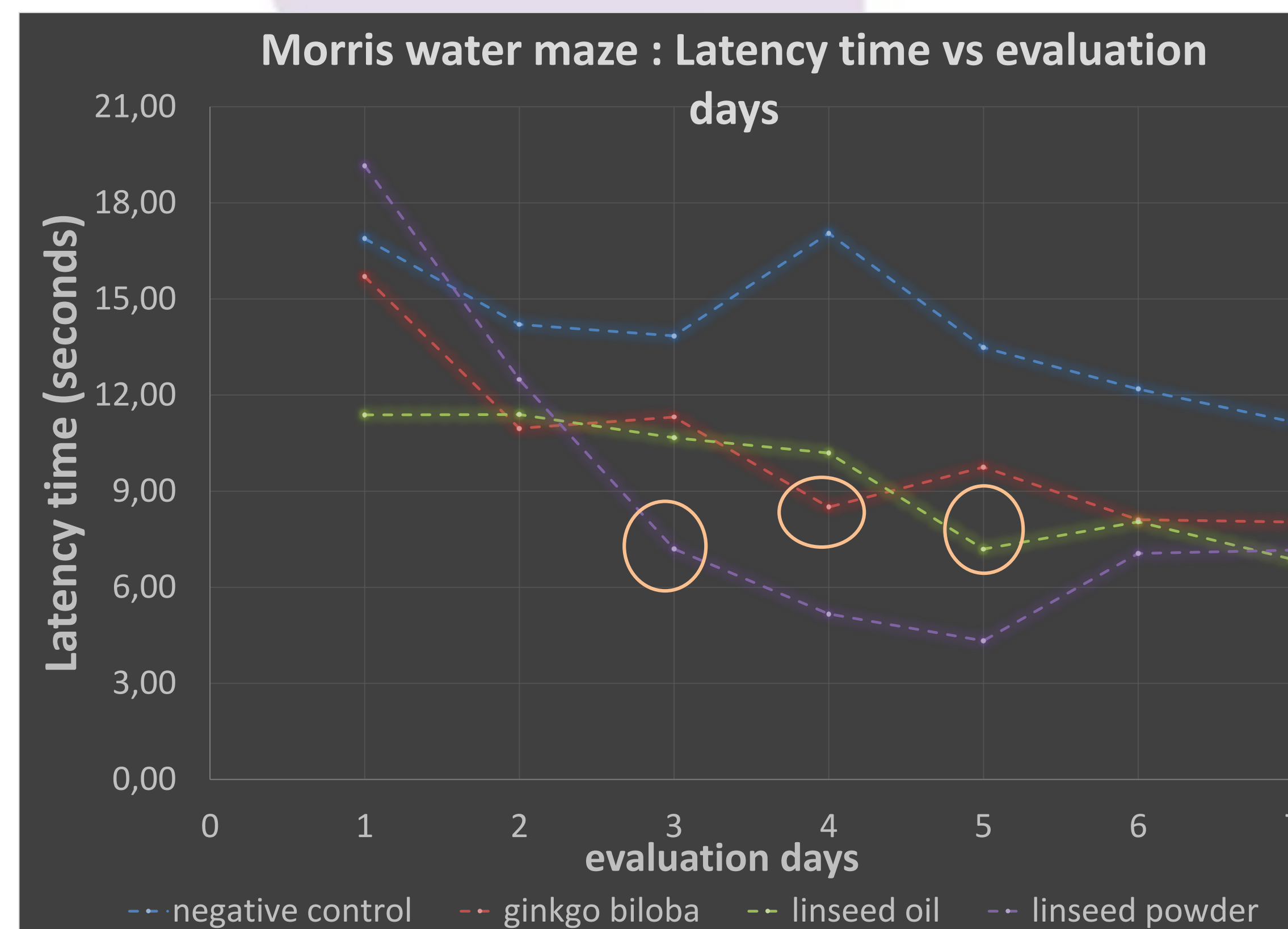


Figure 2. In the linseed powder group, a significant decrease in the latency time was observed on the third day, the ginkgo biloba group on the fourth day and in the linseed oil group on the fifth day.

Table 2: ANOVA

Factors	Sum of Square	Degrees of Freedom	Mean Sum of square	F. calculate d	Critical value of F. Tab 5 %	Critical value of F. Tab 1 %
Total	192980,88	55				
sex	1110,72	1	1110,72	0,89 ns	4,17	7,56
Treatments	158166,54	27	5858,02	4,69 **	1,79	2,3
Groups	98700,64	3	32900,21	26,36 **	2,92	4,51
days	44193,14	6	7365,52	5,9 **	2,42	3,47

There is a significant difference when F. calculated > F. Critical value. The differences between treatments, groups and the evaluation days it does not depend on the sex of the mice.

### Radial 8-arm maze

Duncan test at 5% for the group factor

Groups	Mean	Duncan
Negative control	257,29	A
Ginkgo biloba	170,19	B
Oil linseed	158,36	B
Powder Linseed	155,07	B

Linseed oil and linseed powder groups took a statistically shorter time to find the goal and these are also equivalent to the ginkgo biloba group.

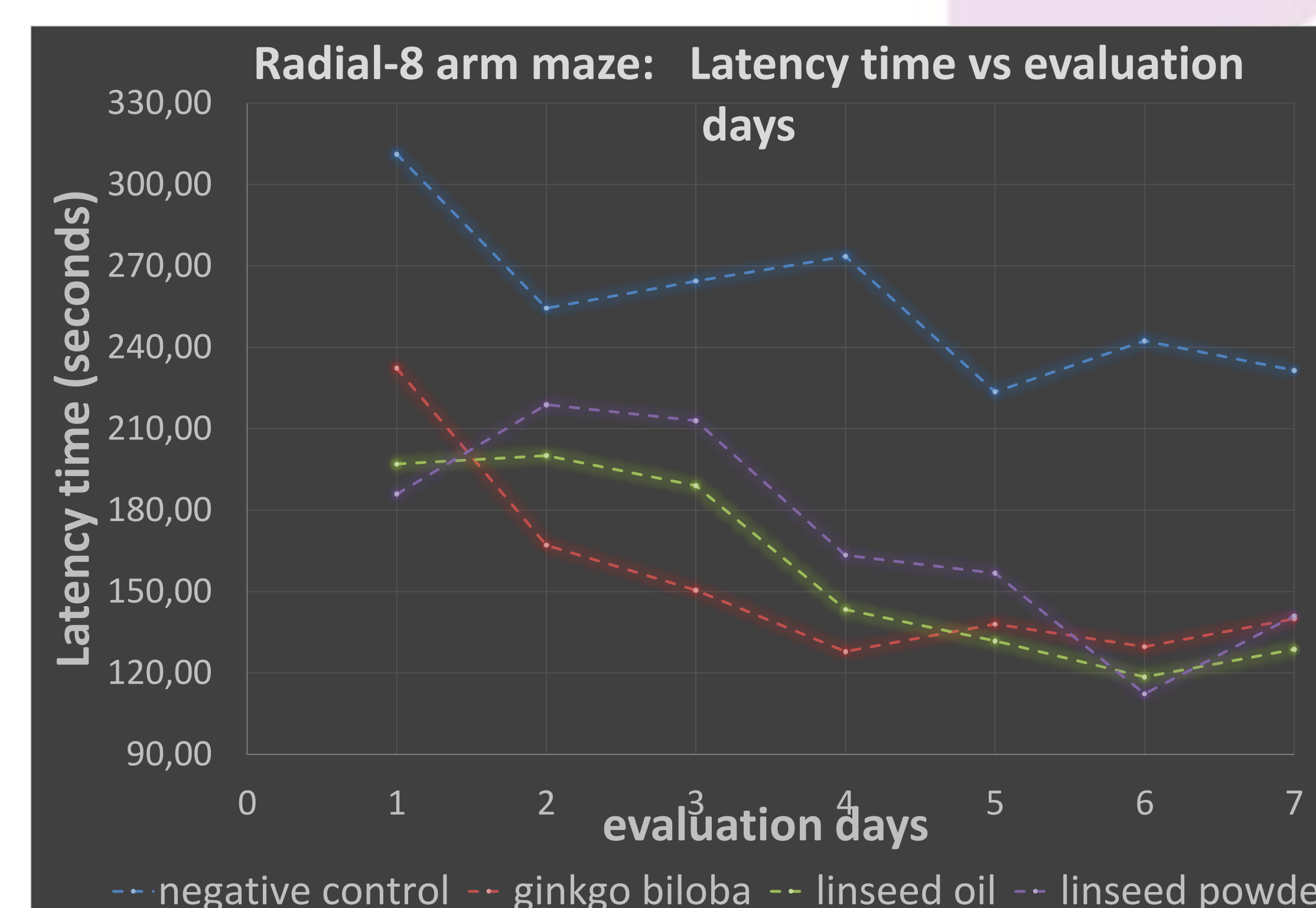


Figure 3. The linseed oil and linseed powder groups show a decrease in the latency time equivalent to each other

### Conclusions:

- In Morris water maze linseed powder proved to be more effective than linseed oil and ginkgo biloba used as a positive control.
- In the radial 8- arm maze, there was no significant difference in the latency time between oil and linseed powder groups, however its effect was equivalent to ginkgo biloba used as a positive control.