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Research Article

Evaluation of Soy Lecithin on Physiological Parameters in Female Wister Rats.

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Abstract

The study was carried out using female Wister rats. The effect of Soy lecithin on the physiological parameters such as fetus growth development and behavioral activities such as locomotor activity and body posture investigating using female Wister rats and after mating and delivery, the fetuses (pubs) was used for investigating the locomotor activities using actophotometer.

The relative weight ratio of animals after delivery per group (n=07) ± S.D. indicates the values are significant ($p < 0.01$) compared to vehicle control and plotted the graph of mean weight of all delivered fetuses versus the day at which their weight was measured. The graph shows 5% and 10% Soy lecithin group animal's shows significant increase in body as compared to vehicle control group animal. The locomotor activity of 5% and 10% Soy lecithin treated group also shows increase in locomotor activity as compared to control group animals. Soy lecithin showed significant fetus growth development and increase locomotor activity in animals.

Key Words: Soy lecithin, locomotor activity, fetus growth development. Wister rats

Introduction

Glycine max (L.) Merrill family (Fabaceae) commonly known as soy lecithin. Soy lecithin consist of three types ogf phospholipids; phosphatidylcholine; phosphatidylethanolamine and phosphatidyl inocitol. It is extracted from soyabean and is generally used as natural emulsifier or stabilizer in various food applications. Soy lecithin has much application such as food based cosmetics, enhances brain and cells development, in cardiovascular protection, in liver protection in weight loss and slimming, lower high blood pressure, good supplement for diabetes etc. The study was undertaken to evaluate the physiological parameters such as fetus growth development and locomotor activity in animals.

Material and Methods

Soy lecithin obtained from Gayatri Globals, Indore, (M.P.) as gift sample was used in the study.

Animals: Female Wister rat were obtained from animal house, S.N. Institute of Pharmacy, Pusad, Maharashtra. Animals were housed in groups of three with two animals in each group at an ambient temperature of 25 ±1% with free access to food and water. For screening of fetus growth development effect female rats were divided in to three different groups. The first group served as control group, the second group was 5% Soy lecithin group and third group was 10% Soy lecithin group. The study protocol was approved by institutional animal ethics committee, Pusad. CPCSEA/IAEC/QA/01-02 physiological parameters.

a) Fetus growth development

In this method two female rats are grouped in to each three group i.e. control group, 5% Soy lecithin group and 10% Soy lecithin group. These animals are kept on feeding food containing 5% Soy lecithin, 10% Soy lecithin 5% Soy lecithin and 10% Soy lecithin group respectively and control group animals are feeded without Soy lecithin for two month. The animals are kept for mating with their feed continuously, the weight of all rats before delivery was noted down in table no. 1.

From the animals rat no. 1 from control group and 5% Soy lecithin treated group and both rats from 10% Soy lecithin were delivered and the weights of all fetuses or pubs of these animals at delivery day and thereafter at the interval of 7 days up to 55 days the weight of all fetuses were taken as relative weight ratio of animals after delivery per group and are noted down.

b) Locomotor activity

The locomotor activities were measured for all animals delivered from control group, 5% Soy lecithin group and 10% Soy lecithin group using actophotometer.

Table 1: Weight of animals before their delivery

Weight of Animal Before Delivery	Control Group		5% Soy lecithin Group		10% Soy lecithin Group	
	Rat No.1	Rat No.2	Rat No.1	Rat No.2	Rat No.1	Rat No.2
	341	220	253	227	255	219

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Table 2: Mean relative weights of animals (Control group)

0 Day weight	Relative Weight	7 th day	Relative weight	14 day	Relative weight	21 day	Relative weight	28 day	Relative weight	35 days	Relative weight	42 day	Relative weight	55 days	Relative weight
6	**1.759531**	15	**4.398827**	21.2	**6.217009**	37.2	**10.90909**	54.25	**15.90909**	70.12	**20.56305**	84.2	**24.6686**	97.2	**28.5044**
4	**1.173021**	13.2	**3.870968**	19.4	**5.68915**	37.5	**10.99707**	58.6	**17.18475**	75.15	**22.03812**	91.2	**26.6921**	105.15	**30.8358**
5	**1.466276**	12.7	**3.72434**	18.2	**5.337243**	33.2	**9.73607**	49.15	**14.41349**	63.4	**18.59238**	82	**24.0469**	101.1	**29.6481**
4	**1.173021**	11.8	**3.460411**	17.9	**5.249267**	34	**9.970674**	47.12	**13.81818**	64.14	**18.80938**	81.1	**23.783**	96.14	**28.1935**
7	**2.052786**	12.8	**3.753666**	18	**5.278592**	33.15	**9.721408**	48.7	**14.28152**	64.15	**18.81232**	82.4	**24.1642**	98.12	**28.7742**
7	**2.052786**	12.1	**3.548387**	16	**4.692082**	33.1	**9.706745**	51.12	**14.9912**	67.6	**19.82405**	84.19	**24.6891**	102	**29.912**
7	**2.052786**	12.6	**3.695015**	17.5	**5.131965**	36.12	**10.59238**	53.12	**15.57771**	69.17	**20.28446**	83.12	**24.3754**	100.1	**29.3548**
7	**2.052786**	13.8	**4.046921**	16.8	**4.926686**	34.5	**10.1173**	50.1	**14.69208**	66.15	**19.39883**	82.5	**24.0909**	101.19	**29.6745**
Mean	**1.722874**		**3.812317**		**5.315249**		**10.21884**		**15.1085**		**19.79032**		**24.5638**		**29.3622**
Stdev	**0.397713**		**0.297828**		**0.467832**		**0.539346**		**1.081727**		**1.158947**		**0.91432**		**0.85359**

*** Weight of animal =341gm**

Table 5: Mean relative weight ratio of animals with their mother

Groups	**0 day**	**7 th day**	**14th day**	**21 day**	**28 day**	**42 day**	**55 days**
Control	1.72	3.81	5.32	10.22	15.11	24.56	29.36
5%Soy Lecithin	2.04	5.78	8.71	14.38	20.56	34.40	41.04
10%Soy Lecithin	2.82	5.77	10.07	15.27	21.54	36.77	44.85

Table 3: Mean relative weights of animals (5% Soy lecithin group)

0 day weight	Relative weight	7 th day	Relative weight	14 th day	Relative weight	21 day	Relative weight	28 day	Relative weight	35 days	Relative weight	42 day	Relative weight	55 days	Relative weight
4	1.581028	13.5	5.335968	22.2	8.774704	37.4	14.78261	52.12	20.60079	68.5	27.0751	85.7	33.8735	97.12	38.3874
6	2.371542	18.2	7.193676	23.4	9.249012	36.4	14.38735	51.62	20.40316	69.7	27.54941	87.11	34.4308	106.4	42.0553
5	1.976285	15.1	5.968379	21.22	8.387352	38.5	15.21739	53.48	21.13834	70.7	27.94466	91.02	35.9763	109.1	43.1225
5	1.976285	13.1	5.177866	20.17	7.972332	33.4	13.20158	52.52	20.75889	73.75	29.1502	88.14	34.8379	110.12	43.5257
4	1.581028	12.7	5.019763	22.11	8.73913	36.14	14.28458	51.2	20.23715	67.5	26.67984	86.15	34.0514	104.12	41.1542
7	2.766798	15.2	6.007905	23.1	9.130435	36.4	14.38735	51.12	20.20553	69.5	27.47036	84.1	33.2411	96.12	37.9921
Mean	**2.042161**		**5.783926**		**8.708827**		**14.37681**		**20.55731**		**27.64493**		**34.4018**		**41.0395**
Stdev	**0.462073**		**0.802933**		**0.473409**		**0.672479**		**0.355001**		**0.854561**		**0.94012**		**2.3616**

*** Weight of animal = 253gm**

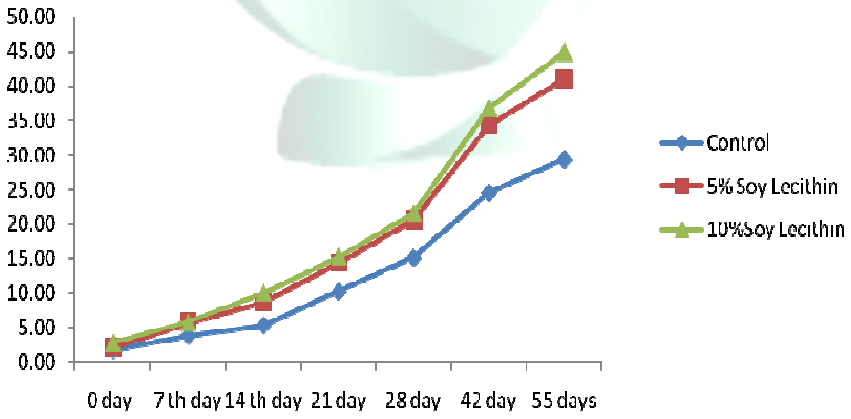

Fig. 1: Mean relative weight ratio of animals with mother.

Table 4: Mean relative weights of animals (10% Soy lecithin group)

0 day		7 th day		14 th day		21 day		28 day		35 days		42 day		49 days	
6.14	2.40784	13.4	5.254902	22.23	8.71765	38.12	14.94902	52.2	20.4706	64.12	25.1451	81.2	31.84314	99.12	38.8706
5.5	2.15686	12.4	4.8627451	24.12	9.45882	34.5	13.52941	51.2	20.0784	68.12	26.71373	84.14	32.99608	104.12	40.8314
6.15	2.41176	14.1	5.5294118	25.1	9.84314	36.4	14.27451	53.14	20.8392	67.12	26.32157	86.14	33.78039	106.18	41.6392
5.8	2.27451	12.1	4.745098	21.12	8.28235	37.5	14.70588	54.12	21.2235	71.12	27.8902	89.14	34.95686	119.1	46.7059
5.7	2.23529	13.12	5.145098	24.12	9.45882	38.5	15.09804	57.12	22.4	78.1	30.62745	94.6	37.09804	121.2	47.5294
5.9	2.31373	14.12	5.5372549	23.4	9.17647	37.5	14.70588	51.5	20.1961	65.12	25.53725	82.2	32.23529	98.1	38.4706
Weight of animal-219gm															
6.6	3.0137	13.21	6.0319635	23.12	10.5571	34.12	15.57991	48.4	22.1005	62.4	28.49315	80.85	36.91781	98.2	44.8402
7	3.19635	14.21	6.4885845	25.5	11.6438	35.4	16.16438	49.5	22.6027	65.19	29.76712	84.1	38.40183	102.4	46.758
7	3.19635	13.15	6.0045662	22.5	10.274	32.13	14.67123	48.12	21.9726	64.12	29.27854	82.5	37.67123	98.5	44.9772
7.3	3.33333	13.5	6.1643836	24.52	11.1963	36.1	16.48402	47.12	21.516	63.5	28.99543	82.1	37.48858	98.2	44.8402
7.3	3.33333	12.1	5.5251142	20.12	9.18721	33.1	15.11416	47.1	21.5068	65.83	30.05936	87.12	39.78082	106.6	48.6758
7.4	3.379	13.12	5.9908676	24.12	11.0137	36.4	16.621	48.6	22.1918	66.12	30.19178	89.1	40.68493	104	47.4886
7.1	3.24201	16.1	7.3515982	26.1	11.9178	36.4	16.621	49.4	22.5571	65	29.68037	88.5	40.41096	105	47.9452
6.8	3.10502	14.12	6.4474886	21.2	9.68037	33.1	15.11416	49.12	22.4292	64.12	29.27854	86.1	39.31507	105.4	48.1279
6.7	3.05936	11.71	5.347032	23.1	10.5479	34.1	15.57078	48.1	21.9635	65.16	29.75342	88.1	40.22831	104	47.4886
Mean	**2.8439**		**5.7617405**		**10.0637**		**15.28023**		**21.6032**		**28.51553**		**36.92062**		**45.0126**
Std ev	**0.47362**	**1.1**	**0.6909641**	**1.701**	**1.07271**	**1.97**	**0.898647**	**2.8575**	**0.86266**	**3.869**	**1.776539**	**3.806**	**3.060946**	**7.0215**	**3.44008**

Results and discussion

a) Fetus growth development

The relative weight ratio of animals after delivery per group (n=07) ±S.D. indicates the values are significant ($p < 0.01$) compared to control group animals (ANOVA followed by Dunnet test) The observations are take for control group, 5% Soy lecithin group and 10% Soy lecithin groups are noted in table no.2, table no.3, and table no.4 respectively and their mean relative weight ratio with their mother was taken and noted down in table no. 5. Then comparing the weight of animals to check the effect of Soy lecithin on fetus growth rate by plotting a graph of mean weight of all delivered fetuses versus the day at which their weight was measured. Graph (fig no.1) clearly shows that the 5% Soy lecithin group animals shows significant increase in body weight and 10% Soy lecithin group animals shows further more increase in body weight as compared to control group animals.

Discussion

The soy lecithin shows increase in fetus growth rate significantly at 5% and slightly more at 10% soy lecithin group as compared to control group animals. The study on

locomotor activity shows that the soy lecithin treated animals shows increase in locomotor activity as compared to control group animals.

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Fig 2: Locomotor activities in animals

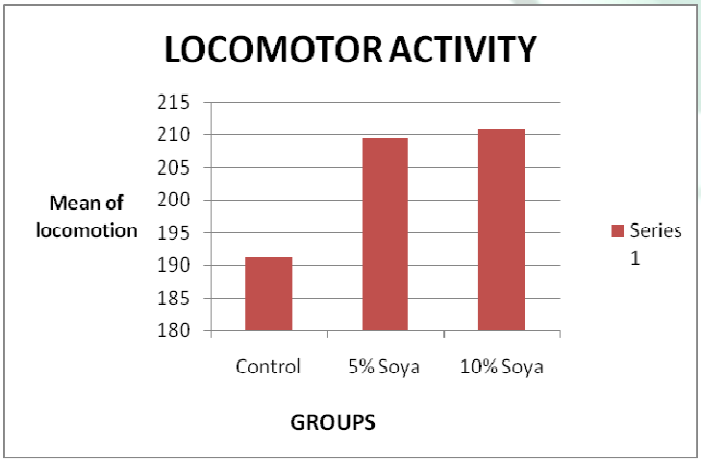

Table 6: Locomotor activities in animals

	Control	5% Soya	10% Soya
	173	188	258
	194	180	197
	207	230	202
	191	240	187
Mean	**191.25**	**209.5**	**211**
Stdev	14.00893	29.90541	31.94787