THE EFFECTS OF BALANCE OF NATURE UPON LACTATION IN RATS

Andrei G. Vasiliev, Lev D. Balashov
St. Petersburg State Pediatric Medical Academy, Pathologic Physiology Dept.

Summary
Balance of Nature (BoN) a unique complex preparation produced by means of lyophilization of fresh vegetables, fruit, and spices was studied in a rat experimental model to determine its possible stimulatory effects upon milk production in lactating women. BoN proved to validly increase milk yield and prolactin level in lactating rats as well as the cubs weight gain.

Introduction
Milk production deficiencies are often hampering breast feeding. Pharmacological treatment of oligogalactia is not very efficient and anyway not desirable due to possible complications for both baby and mother.
Therefore herbal and other natural preparations and methods are much more welcome. Some plant preparations, foodstuffs and medicines are traditionally used to induce milk production or to increase milk yield in women with of oligogalactia. Among the former are *Asparagus racemosus, Acacia nilotica, Aloe vera, etc.* Very little is known about their biological activities and mechanisms of effects. Some plants have been identified as lactogenic because of a capacity to stimulate the synthesis of lactogenic hormones (prolactin, growth hormone, cortisol) and/or β-endorphin and β-casein accumulation in the mammary gland. Prolactin plays a key role in mammogenesis and lactogenesis. After parturition, it induces lactation by direct stimulation of the synthesis of milk proteins in the epithelial cells and indirect stimulation of the proliferation of secretory cells. Other hormones (HGH, corticosterone and other steroids) also play important roles.

Balance of Nature is a unique complex preparation produced by means of lyophilization of fresh vegetables, fruit, and spices that is used in a broad spectrum of conditions for treatment and prophylactic of various pathologic conditions and diseases.

Non-systematized clinical data indicates possible positive effects of Balance of Nature upon lactation and milk yield. BoN with its balanced rich formula is expected to stimulate lactation in different ways however its lactogenic effects haven't been as yet systematically studied.

Rat experimental model was used to determine if and how Balance of Nature can stimulate milk production in lactating women. The effects of BoN were checked in lactating rats by the milk yield, cubs weight gain as well as prolactin and other related hormons' plasma levels.

Materials and Methods
For all experiments, 18 mature Wistar rats of 160 – 180 g bodyweight at the beginning of lactation were used. They were housed individually in standard plastic cages with wood chips on the floor and were allowed unlimited access to food and water. BoN was given orally with food twice a day. The number of cubs in each litter varied from 8 to 11. It was reduced to 8 in each case on the 2^{nd} day after parturition. Milk production and bodyweight was measured on day 4^{th}, 6^{th}, 10^{th} and 14^{th} of lactation. Milk yield and weight gain of cubs were measured with an electronic balance accurate to 0,05 g. There were 3 groups with 6 lactating rats in each. The first one was Control, the rats from the second one started receiving BoN after parturition and the rats of the third group started it 3-4 weeks before parturition and continued it during lactation.

On every day of weightings (4^{th}, 6^{th}, 10^{th} and 14^{th} day of lactation), the cubs were weighed at 9-00 am (w1) and subsequently isolated from their mother for 4 hours. At 1-00 pm the cubs were weighed again (w2), returned to their mother and allowed to feed for 1 hour. At 2-00 pm they were weighed for the last time (w3). They were subsequently left with their mother during the rest of the day and the night. Milk yield per cub per hour was estimated as (w3 – w2). To correct it for weight loss due to metabolic processes in the cub (respiration, urination and defecation) during suckling the value (w1 – w2)/4 was added. Daily weight gain of cubs was calculated from the cub weight at w2.

To avoid influences upon lactation blood samples for measuring prolactin concentration were taken only once at the end of the experiment on day 14^{th}. Prolactin serum levels were determined by IEA

Results
Milk production in both groups receiving BoN was higher than that of the control group (tab. 1; fig.1). Milk yield In the control group (g per cub per 5 hours) increased from 0,22±0,02 g up to 0,43±0,03 g in ten days while in both experimental groups it was a little higher from the beginning 0,26±0,02 and 0,30±0,03 and increased up to 0,61±0,05 and 0,64±0,05 on the 14^{th} day of lactation.

Table 1. The effect of BoN upon milk production (g per cub per 5 hours (4 hour separation + 1 hour suckling))

Group \ Day after parturition	4th	6th	10th	14th
Control	0,22±0,02	0,28±0,03	0,36±0,03	0,43±0,03
Experimental 1	0,26±0,02	0,38±0,03	0,41±0,03	0,61±0,05
Experimental 2	0,30±0,03	0,36±0,04	0,46±0,04	0,64±0,05

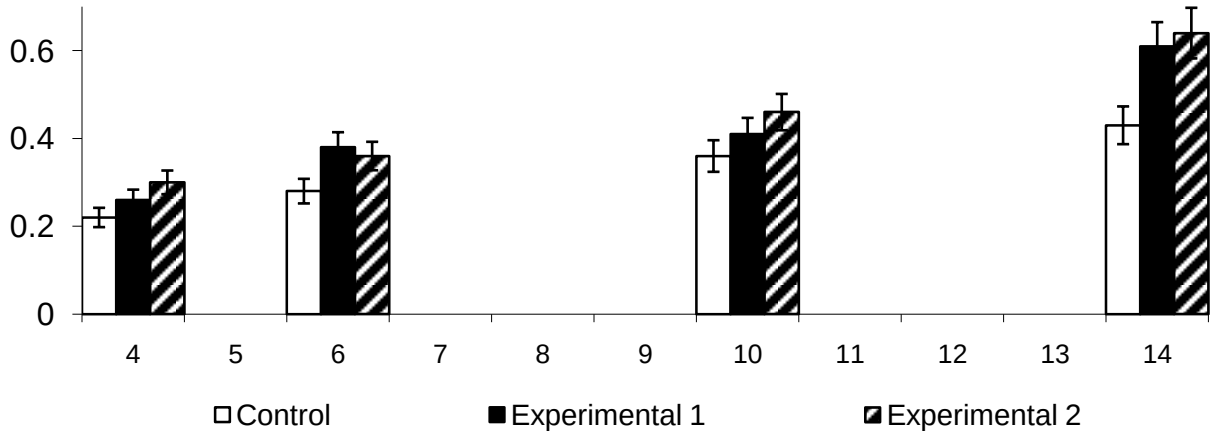


Fig. 1. The effect of BoN upon milk production (g per cub per 5 hours (4 hour separation + 1 hour suckling))

Mean milk yield (g per cub per 5 hours) in the Experimental groups #1 and #2 was also higher ($p<0,05$) than in the Control group: 0,43±0,06 and 0,45±0,07 vs 0,34±0,05.

BoN proved also to stimulate the cub weight gain (tab. 2; fig.2). The mean weight of a cub from Control group on day 4th was 8,2±0,2 g and increased up to 17,0±0,5 g on day 14th. The weight of a cub from the Experimental group 1 was higher on day 4th - 8,6±0,3 and by the 14th day it increased more – up to 22,4±0,6 g. The weight of a cub from the Experimental group #2 on day 4th was higher than in the Controls and higher than in Experimental group #1 - 9,2±0,3 and by the end of the 2nd week it was also higher than in the Controls and in Experimental group #1 - 23,2±0,8 g.

Table 2. The effect of BoN upon cub weight gain (g)

Group \ Day after birth	4th	6th	10th	14th
Control	8,2±0,2	10,1±0,3	12,9±0,4	17,0±0,5
Experimental 1	8,6±0,3	11,2±0,4	16,4±0,5	22,4±0,6
Experimental 2	9,2±0,3	11,6±0,3	16,6±0,5	23,2±0,8

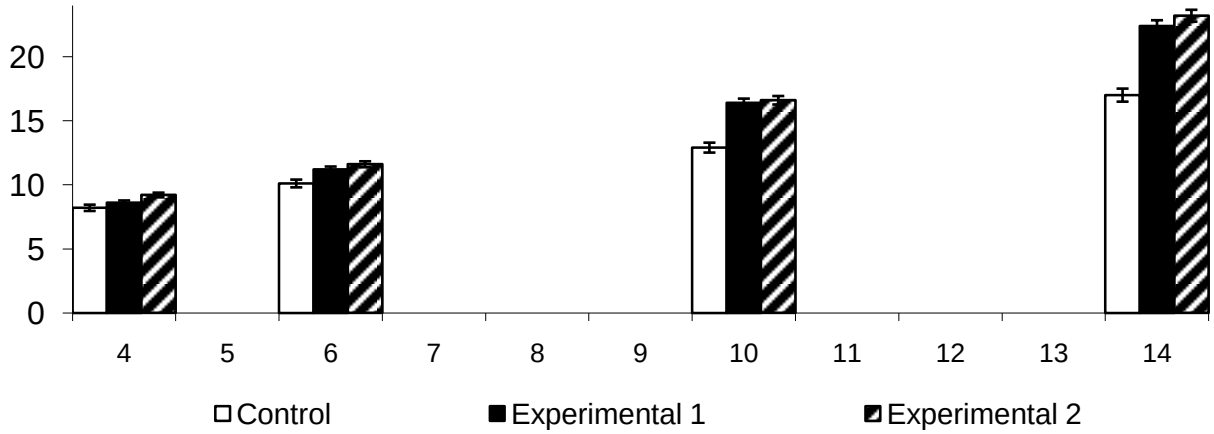
Fig. 2. The effect of BoN upon cub weight gain (g)

The mean daily cub weight gain (g/day) in both Experimental groups was also considerably higher ($p<0,01$) than in the Controls (tab.3):

Table 3. Mean daily cub weight gain (g/day)

Group	Weight gain
Control	0,88±0,09
Experimental 1	1,38±0,08
Experimental 2	1,40±0,06

Prolactin level as well as that of Somatotropin and Corticosterone increased considerably in lactating rats. BoN validly increased concentration of Prolactin, РПР and Corticosterone in comparison to control group (lactating rats of the same age, bodymass and term after parturition.) (tab. 4, fig. 3).



Tab. 4.The effect of BoN upon concentration of PRL, РПР and Corticosterone

Days after parturition = 14 / Group	Prolactin nmol/l	Somatotropin pmol/l	Corticosterone nmol/l
Non-lactating non-pregnant female rats (n=6)	7,1±2,4	21,7±4,0	56,8±4,3
Control (n=6)	25,9±4,5	28,2±3,1	71,8±6,4
Experimental 1 BoN started after parturition (n=6)	34,6±4,8 *	31,1±4,2	78,0±9,2
Experimental 2 BoN started 4 weeks before parturition (n=6)	35,2±5,3 **	33,3±3,8	72,4±8,1

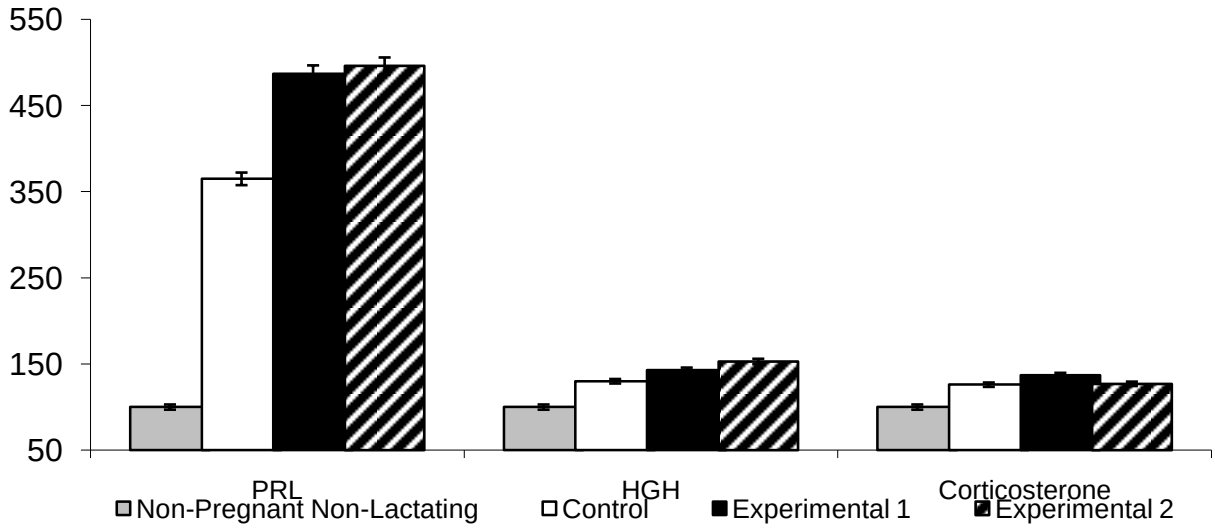


Fig. 3. Mean concentrations of prolactin, HGH and corticosterone in control and experimental groups in per cent of their values in non-lactating non-pregnant rats ("Controls").

Conclusion

BoN taken by lactating rats proved to validly increase their milk yield and prolactin level as well as the cubs weight gain. However difficult it is to transfer results yielded in experimental models into clinical practice, Balance of Nature may be recommended for assessment of its therapeutic potential in the treatment of hypogalactia.

References

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