



## EFFECT OF THE THYROXINE ON DISACCHARIDASES ACTIVITY

Komilova Bakhmal Odilovna

Candidate of Biological Sciences, Senior Lecturer at the Department of Physiology.  
Bukhara State Medical Institute, Bukhara, Republic of Uzbekistan.

### Abstract

Under the influence of various hormones, the development of the digestive system can clearly change. Under the action of the hormone thyroxine, the activity of lactase is prematurely suppressed. The sucrase activity is induced prematurely. The repressive and inductive effects of the enzyme depend on the age of the animal, which was observed only in the middle and second half of the lactation period. Age-related changes in intestinal enzymes under the influence of hormones occur in the presence of complex mechanisms.

**Keywords:** ontogenesis, lactase, sucrase, lactotroph, enzyme. thyroxine, distal, repression, induction, infection, carbohydrase, definitive.

**Аннотация:** Под влиянием различных гормонов может явно измениться развитие органов пищеварения. Под действием гормона тироксина активность лактазы преждевременно подавляется. Активность сахаразы индуцируется преждевременно. Репрессивные и индуктивные эффекты фермента зависят от возраста животного, что наблюдалось только в середине и второй половине периода лактации. Возрастные изменения ферментов кишечника под влиянием гормонов происходят при наличии сложных механизмов.

**Ключевые слова:** онтогенез, лактаза, сахараза, лактотроф, тироксин, дистальный, репрессия, индукция, инфекция, карбогидраза, дефинитив, фермент.

### Introduction

As the great thinker Abu Ali ibn Sina said, just as the plant world and the whole world cannot do without sunlight, so human beings cannot be fully developed and perfected without mother's milk. After all, it has been scientifically proven that breast milk is rich in the most useful substances and vitamins for the child. According to experts, the incidence of cardiovascular diseases, atherosclerosis, insulin-dependent diabetes mellitus, decreased visual acuity, mental illness is 30-40 times higher than in





breastfed peers. In addition, the majority of girls who were fed artificial milk gave birth to a child with a much lower weight and prone to anemia.

### Relevance of the Topic

The role of thyroxine in the mechanisms of lactose and sucrose assimilation has only recently begun to be seriously studied. The relevance of this problem lies in the fact that the state of lactase deficiency depends not only on the genotype, but also on the impact of any stressors and hormones. Under the influence of various hormones, the development of the digestive organs can change dramatically. To find ways to prevent and eliminate these changes, it is necessary to study in more depth the patterns of development of the digestive organs.

### Research Results and their Discussion

The enormous administration of lactase will begin synthesis in regulatory deferring mammals in regulatory development. The small intestine crushes of the daily rusts are reserves of a certain activity. The highest level of enzyme activity was determined in seven and ten days. In fourteen and twenty-one-day rats, lactase activity was declining this activity twenty-eight these results match the data of other authors (8,9,10).

The area of the saharaza is not yet no appeared in three and seven-day rats. His appearance or activation in the ingenuity of his hand was clearly visible in ten-day rats. As the organism grew, the activity of the enzyme was also increased (Table 1).

Table 1. Change in lactase and saving activity in ontogenesis (M + m; p = 6).

The animal age (days)	l a k t a z a		S a x a r a z a	
	mkol / min / g	%	mkol / min / g	%
3	19.3 ± 1.0	75.0 ± 4.0	0.0	0.0
7	25.9 ± 2.3*	100 ± 8.0*	0.0	0.0
10	20.7 ± 1.0	80.0 ± 4.0	0.9 ± 0.1	11.0 ± 1.2
14	14.8 ± 1.0*	57.0 ± 4.0*	1.7 ± 0.2*	20.0 ± 2.2*
21	8.5 ± 0.7*	33.0 ± 3.0*	4.8 ± 0.5*	56.0 ± 6.0*
28	2.1 ± 0.2*	8.0 ± 0.7*	8.5 ± 0.7*	100 ± 8.0*

The change in lactase activity in the overdated bowel is reflected in the body of the cell surface. In dailyits, the activity of lactazage on the cell membrane surface was 11.1 + 0.6 mm / g; In seven and ten-day rats, the activity of the enzyme rose to a higher level (20.0 + 1.5 mmcol / g).



The activity of lactase has declined since the fourteenth day. This decrease in the enzyme activity is twenty, especially in twenty-eight-day rats.

Adjararasau in the overturnal bowel does not have absolute activity in children as in the sake of the noise. The surface of the enzyme's cell membrane is very low in ten-day rats, fourteen and twenty-one-day rats, and twenty-eight days have reached the highest (Table 2).

Table 2. A change in lactase and saving activity in ontogenic intestines in ontogenesis (M + m; p = 6).

The animal age (days)	L a k t a z a		S a x a r a z a	
	mkol / min / g	%	mkol / min / g	%
3	11.1 ± 0.6	55.0 ± 3.0	0.0	0.0
7	20.0 ± 1.5*	100 ± 7.0*	0.0	0.0
10	14.0 ± 0.8*	70.0 ± 4.0*	0.5 ± 0.04	8.0 ± 0.6*
14	9.9 ± 1.0	50.0 ± 5.0	1.0 ± 0.1*	15.0 ± 1.5*
21	5.1 ± 0.3*	26.0 ± 1.8*	2.9 ± 0.3*	45.0 ± 4.6*
28	1.3 ± 0.1*	6.0 ± 0.6*	6.5 ± 0.6*	100 ± 11.0*

A comparison of lactase activity in the intestinal mucosa and in the rectum showed that the activity of enzymes studied in postnatal ontogenesis (1-28 days) in rats developed in the same direction. However, the activity of lactase in the inverted intestinal tract is significantly lower and not stable than the activity in the crushed intestine. Hence, the rate of enzyme activity increased slightly with the growth of rats. Thus, lactase production in rat children was higher in the first week of the lactation period. Enzyme activity decreases sharply after a period of independent feeding.

If we compare the activity of sucrose in the crushed and its overturned part, we see that the activity in the overturned intestinal tract is much lower than in the crushed. However, this process is not the same in rats of different ages. In ten-day-old rats, the accumulation of sucrose activity on the intestinal cell membrane surface (relative to intestinal mucosa) was 55.0 + 3.0%, and did not change in fourteen- and twenty-one-day-old rats, but increased sharply on twenty-eighth day. Thus, the formation of the enzyme sucrose in rats and its attachment to the cell membrane surface is not observed at all in the first week of the lactation period. By the beginning of the second week, enzyme activity appears, and it increases sharply in the third week (before the transition to independent feeding).



The results of the experiment showed that the reaction of the mechanisms responsible for the formation of the enzyme lactase or its transport to the cell membrane surface to the hormone thyroxine is much more complex and depends on the age of the animal. Lactase activity in the intestinal mucosa did not change at all when subcutaneous injection of thyroxine hormone (2 mg / kg) in three-day-old rats. When the same dose of hormone is given to rats, the enzyme activity decreases. The decrease in enzyme activity was evident 72 hours after hormone delivery, and then gradually decreased, approaching the norm.

Decreased lactase activity under the influence of the hormone was also observed in fourteen-day-old rats. However, a decrease in enzyme activity was observed not 48 hours after hormone delivery, but 48 hours later. In twenty-one-day-old rats, however, no change in lactase activity was observed, as rats of this age lost the ability to repress lactase activity relative to thyroxine. The reaction of lactase activity in the ingested intestinal tract to thyroxine hormone also occurred with age-related changes in crushing activity. However, a decrease or repression of lactase activity in the hormone-induced intestinal tract occurred 24 hours prior to crushing (Fig. 1).

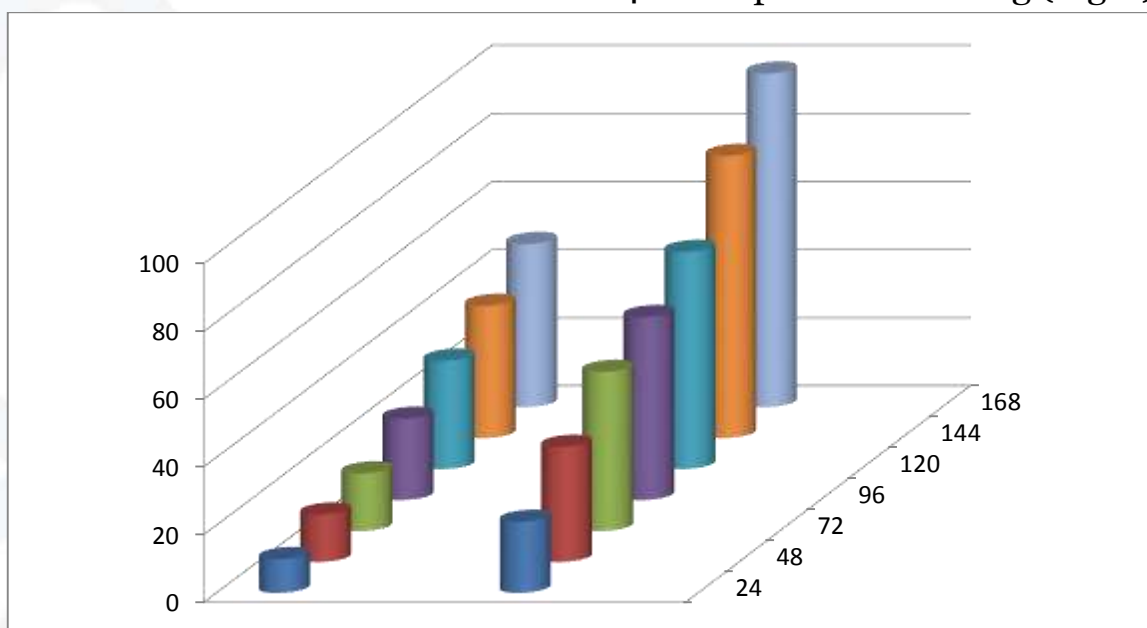


Figure 1. Effect of turcine on lactase activity in the inverted intestinal tract of rat children of different ages. Note: Ordinate axis-enzyme activity (in percent). On the abscissa axis – hours.

Thus, the results of our experiments showed that under the influence of thyroxine hormone of the thyroid gland, the enzyme lactase is formed in the intestinal cell cytoplasm and its binding to the cell membrane surface is repressed. Such a repressive effect depends on the age of the animal, which was observed only in the middle and



second half of the lactation period. Therefore, the hormone thyroxine, which is externally injected during this period, leads to premature repression of lactase activity and causes lactose breakdown in the gastrointestinal tract.

Considering the biological role of the hormone thyroxine in the ontogenesis of intestinal hydrocarbons, the repression of lacquer under the influence of thyroxine is considered a biologically positive condition. Because it stimulates the function of the digestive organs. However, in the development of the intestinal enzyme system of the growing organism is necessary not only a decrease in lactase synthesis, but also the activation of the processes of formation of enzymes in the group of definitive hydrocarbons. We will now look at how the enzyme sucrose, which provides digestion of sucrose, which enters the gastrointestinal tract of humans and animals through food, is altered by thyroxine.

Induction of sucrase enzyme in the intestinal mucosa by thyroxine (2 mg / kg) was observed in seven-day-old rats. This induction occurred 24 hours after hormone delivery, and it peaked after 72 hours. Induction of the sucrase enzyme was also observed in fourteen-day-old rats. However, the highest level of this induction occurred not after 72 hours but after 48 hours and then decreased significantly (Figure 2).

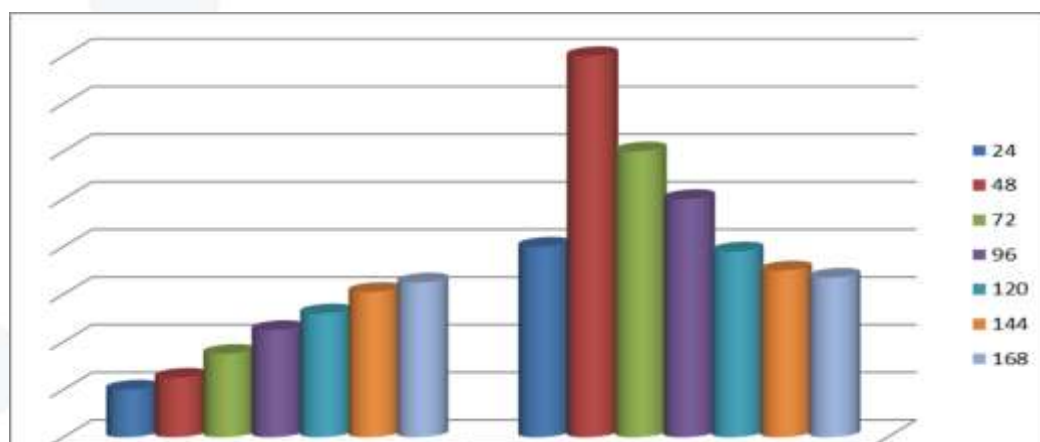


Figure 2. Effect of thyroxine hormone on changes in the ontogenesis of sucrose activity in the intestinal mucosa of 14-day-old rats. K- control group, T ~ experimental group.

Induction of sucrase activity was not observed in twenty-one-day-old rats because the thyroxine hormone lost its ability to induce sucrase activity in rats of this age. Therefore, the activity of sucrase is around the norm. The activity of sucrase in the ingested intestinal tract also varies with age, as does the activity in the esophagus.



Thus, repression of lactase activity and induction of sucrase activity under the influence of the thyroxine hormone occurs prematurely. Examination of the enzyme activity in the intestinal mucosa and the ingested portion showed that the repression of lactase and induction of sucrase under the action of the hormone thyroxine is observed not only in the formation of these enzymes, but also in their adhesion to the cell membrane surface. The reaction of intestinal enzymes to thyroxine depends on the age of the rat. The effect of thyroxine was not observed in three-day-old rats, its effect was evident in seven- and fourteen-day-old rats, and disappeared again in twenty-one-day-old rats.

In conclusion, a sharp decrease in lactase activity in mammals before the transition from breastfeeding to independent feeding is associated with the activity of the thyroid gland. The natural repression of the enzyme is observed at the end of the lactation period, as by this time thyroxine is increased in the blood and lactase is repressed. Repression of lactase causes the lactose in milk to not be broken down. As a result, the digestive process of human and animal children is disrupted and they begin to reject breast milk. The mother's body is relieved of the burden of feeding the baby and is able to begin the next reproductive cycle.

Another feature of lactose in breast milk is that it is involved in managing the trophic connection between mother and child during development. This property of lactose is in turn due to the activity of the thyroid gland. In our experiments, premature repression of lactase was observed when thyroxine was given to infants of rats, which accelerated the rupture of the trophic connection between mother and child. Also, age-specific changes in intestinal enzymes under the influence of hormones occur in the presence of complex mechanisms. In this case, special receptors in the intestinal cells that bind hormones play an important role. The reaction of enzymes to thyroxine depends on the formation of systems that transport the corresponding receptors and hormone receptor junction to the cell nucleus.

Due to this connection, the digestion of lactose in the offspring of mammals in the early stages of lactation maintains its stability, regardless of the presence of thyroxine in the blood. This protects the young organism from hypolactasia. As we approach independent feeding, that is, when the need for lactose decreases, the mechanism that synthesizes this enzyme reacts (represses) thyroxine. We see here that the mechanisms responsible for lactose digestion are inactivated to thyroxine in the early days of the lactation period and react with hypersensitivity before the transition to independent feeding.





## Literature

1. Belmer S. V., Muxina Yu. G., Chubarova A. I. and dr. Lack of lactose intolerance in children and adults // *Lechashchiy Vrach*. 2005. № 1. p. 34–38.
2. Ipatova M.G., M.I. Dubrovskaya, T.I. Korneva, E.K. Kurgasheva, Yu.G. Muxina. Lactase deficiency in children of early age and the peculiarities of nutrition in pathology. *Voprosy sovremennoy pediatri* 2012. 11№1. p19-23.
3. Kon I. Ya., Gmoshinskaya M. V., Shilina N. M. Features of the composition of female milk // *Nutrition zdorovogo and sick child*. M., 2008. p. 6–9.
4. Komilova B.O. Effect of hydrocortisone on lactase and sucrase activity *New day in medicine* 2 \ 1 (29 \ 1) 2020.
5. Komilova B.O. Effect of low temperature on milk sugar absorption. *Biology and integrative medicine*. № 5 – september october (52) 2021.p 4-11
6. Komilova B.O. The effect of thyroxine on the activity of lactase and sucrase in ontogenesis. *Biology and Integrative Medicine* No. 6 - November-December (53) 2021. p. 148- 154
7. Kuchkarova L.S., Kudeshova G.T., Dustmatova G.A. Hormonal regulation of assimilation of carbohydrates in the small intestine during the period of molochnogo nutrition // *Nauchnoe obozrenie. Biological sciences*. 2017- № 2 .-- p. 108-116.
8. Комилова, Б. О. (2018). Влияние гербицидных препаратов на картину крови. *Научный журнал*, (5 (28)), 124-125
9. Камилова, Б. О. (2016). Влияние малых доз препарата " Эдил" на картину лейкоцитов (белых кровяных телец). *Учёный XXI века*, (6-3 (19)), 76-78..
10. Камилова, Б. О. (2020). The influence of the low-temperature environment on the activity of lactase in various parts of the small intestine. *Новый день в медицине*, (2), 692-694.
11. Комилова, Б. О. (1998). Влияние некоторых эндо-и экзогенных факторов на регуляцию лактозной активности в онтогенезе млекопитающих.
12. Комилова, Б. О. (2021). СУТ ҚАНДИНИНГ ЎЗЛАШТИРИЛИШИДА СОВУҚ ҲАРОРАТНИНГ ТАЪСИРИ. *Биология и интегративная медицина*, (5 (52)), 4-11.
13. Abdullayeva, O. D., & Odilovna, K. B. Value of the pyridoxine of the hydrochloride and copper in prevention of atherosclerosis (Literary review). 1000 kopii., 4.
14. Mustafayeva, M. I. (2021). A brief study of the floristic composition of algae in purification facilities and on the regularities of their development. *Кронос: естественные и технические науки*, (5 (38)), 3-4.
15. Mukhina Yu.G., Shumilov P.V., Dubrovskaya M.I. and dr. Disaxaridaznaya nedostatochnost u detey // *Voprosy prakticheskoy pediatrii*. 2008; 3: p.56-62.
16. Savanovich I. I, Sikorski A. V. Lactase deficiency in children. Minsk BGMU 2013.

