



Copyright: Original content from this work may be used under the terms of the creative commons attributes 4.0 licence.

Effects Of Different Food Contaminants On The Activity Of Digestive Enzymes

Kiyomova Nozigul

Teacher Of The Department Of Zoology And Physiology, Karshi State University, Karshi City, Republic Of Uzbekistan

Muminov Beknazar

Student Of Faculty Of Natural Sciences, Karshi State University, Karshi City, Republic Of Uzbekistan

ABSTRACT

This article examines the effects of various contaminants on the activity of digestive enzymes, including disaccharides, as well as helps to understand the etiology and pathology of the disease in various food intoxications, as well as to identify adequate treatment options.

KEYWORDS

Contaminant, postnatal period, mucosa, experiment, villi, intoxication

INTRODUCTION

To date, food pollution has been recognized as a global problem [1. 2]. The severity of the problem is related to the fact that if food contamination occurs in one region of the planet, it directly or indirectly affects the health of consumers living in neighboring, near and far regions [3]. Today, diseases, many of which are related to food or water content, are on the

rise around the world, affecting millions of people.

Studies show that the negative effects of food occur both through environmental pollution and through the “anthropogenicization” of food, that occurs by moving away from natural forms as a result of physical and chemical processing.

PURPOSE OF WORK

To study the effect of certain food contaminants on the digestion of disaccharidases

MATERIALS AND METHODS

For the experiments, white rats were taken from the Tashkent Zoo and kept in separate cages of 50x30x28 cm³ in the vivarium of the Faculty of Biology of the National University of Uzbekistan under the Department of Physiology and Neurobiology. The room temperature in which the rats were kept was 20-25°C and the relative humidity was 40-60%. The lighting mode was natural. The date of birth was recorded as day 0, and the growing rats were kept with their mother in separate cages until the end of the observation. The animals' diet consisted of a standard vivariate diet. The rats were not restricted in feeding and drinking water.

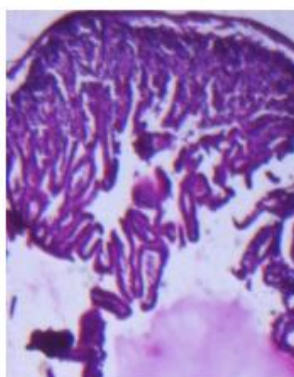
The experiments were performed on growing rats. On the 15th, 17th, 18th days of postnatal life, rats were given food contaminants (heavy

metals - lead acetate (80 mg / kg), taste-modifying additives - sodium glutamate (80 mg / kg). After giving them the rats were given for another 7 days the antidote pectin and nutrient supplement curcumins as correction agents.

During the experiments, along with morphometric parameters of the digestive tract, samples for microscopy of the mucosa of the small intestinal mucosa, the activity of enteral enzymes (maltase, sucrose and lactase) were determined.

RESULTS

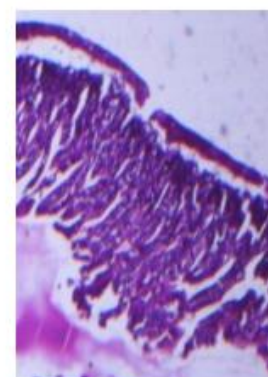
The effect of different food contaminants on the histostructure in the rat intestine is shown in Figure 1. As can be seen from the picture, the changes are most strongly expressed in lead acetate. In rats in the control group, the villi are parallel and dense. In lead acetate intoxication, desquamation of the mucosal and submucosa layers and complete disruption of the structure of rats villi occur. Extrusion occurs under the influence of sodium glutamate.



Sodium glutamat



Lead acetate



Control group

Figure 1. The effect of various food contaminants on the intestinal microstructure. The dye is hematoxylin-eosin

Maltose. In 21-day-old rats, i.e. rats transitioning from a mixed diet to an independent diet, the specific activity of maltose was well expressed, with a protein content of 281.4

$\pm 11.5 \mu\text{mol/min/g}$. Under the influence of lead acetate, the activity of the enzyme increased by 35.7% ($P < 0.05$), the specific activity of the enzyme under the influence of sodium glutamate did not change.

Sucrose. The activity of this enzyme was $20.4 \pm 1.3 \mu\text{mol/min/g}$ protein in rats in the control group. The activity of the enzyme under the influence of lead acetate, sodium glutamate was 69.6% ($P < 0.001$); Increased by 48.0% ($P < 0.02$).

Lactose. The activity of lactase, which is involved in the breakdown of milk sugar, was

$28.8 \pm 1.3 \mu\text{mol/min/g}$ of protein in rats on the eve of independent feeding.

Enzyme	Control group		Lead acetate		Sodium glutamate	
	<u>M±m</u>	%	<u>M±m</u>	%	<u>M±m</u>	%
Maltose	281.4±11.5	100	381.9±20.3	135.7	304.7 ±17.1	111.2
P			<0.05		>0.25	
Sucrose	20.4±1.3	100	34.6±2.1	169.6	34.2±3.3	148.0
P			<0.001		<0.02	
Lactose	28.8±1.3	100	34.2±2.7	123.0	22.4±1.6	91.4
P			<0.05		>0.25	

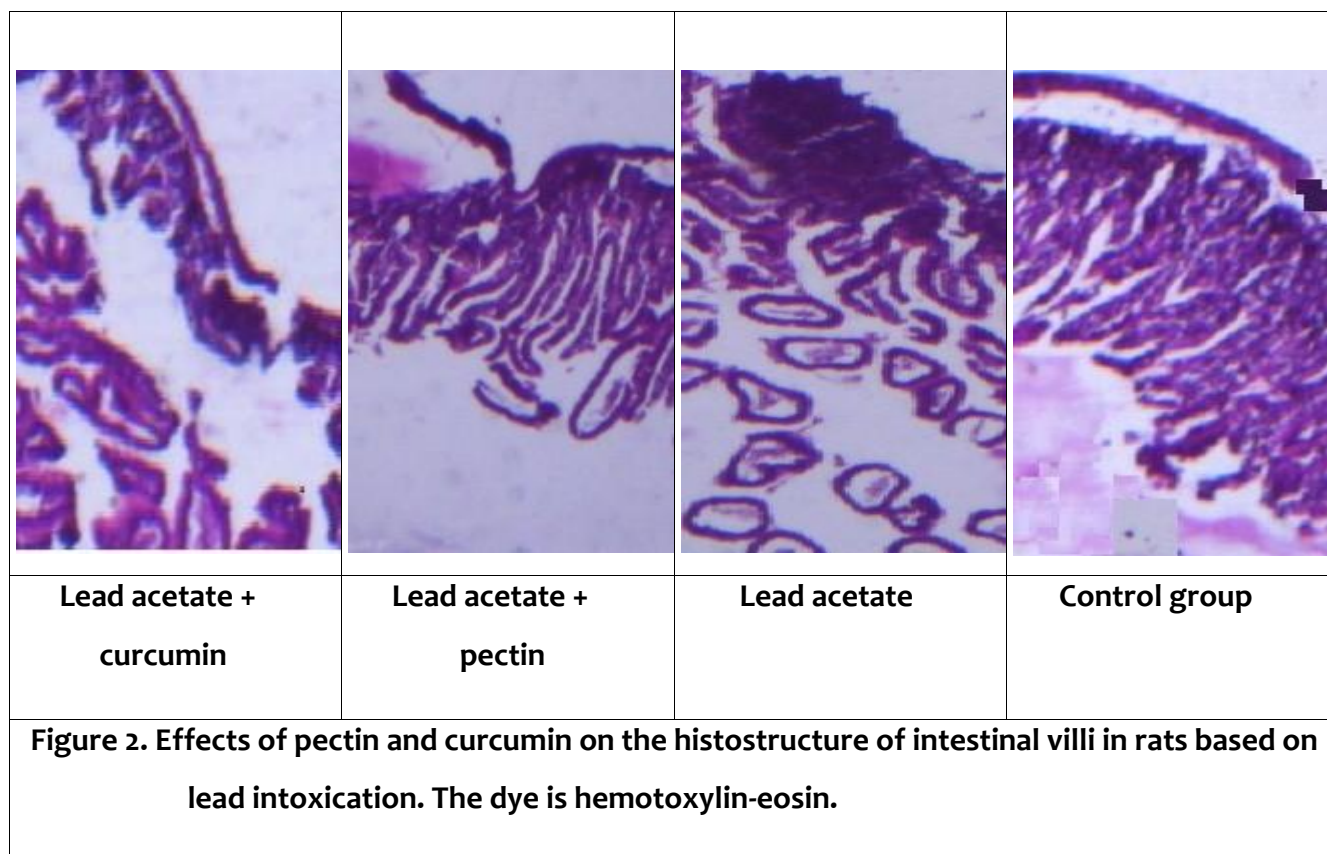
Effect of some food contaminants on the relative activity of intestinal disaccharidases in rats ($\mu\text{mol/min/g}$ protein; $M \pm m$, $n = 5$)

Data on changes in specific and integrative protein levels based on lead intoxication showed that in rats treated with lead acetate, the specific protein content in the small intestine decreased by 13.0% and the integrative protein content decreased by 21.6%. Under the influence of sodium glutamate given orally to animals for 5 days after lead acetate, the specific and integrative amounts of the protein return to the control level. When curcumin is given to animals intoxicated with heavy metal, the specific

amount of protein in the small intestine returns to the control level,

but the integrative amount of protein decreases by 11.0% from the control values.

Thus, both pectin and curcumin have the property of correcting the decrease in protein in the intestinal mucosa observed in lead poisoning.



Thus, when dietary supplements (pectin and curcumin) are used on the basis of lead acetate intoxication, the corrective effect of pectin on the structure of intestinal villi is better expressed than that of curcumin.

CONCLUSION

Under the influence of food contaminants - lead acetate, sodium glutamate and tetracyclines, changes in intestinal histostructure are observed. These changes were expressed in desquamation of villi (lead acetate), extrusion of epithelial cells (sodium glutamate) and malnutrition of microvilli (tetracycline). Lead acetate, sodium glutamate, and tetracycline increase the activity of enteral α -glucosidases (maltose and sucrose). Based on the increase in the activity of maltase and sucrose, the activity of β -galactosidase, i.e. lactose, increases under the

influence of lead acetate, does not change under the influence of sodium glutamate, and decreases under the influence of tetracycline, and vice versa. Based on lead intoxication, the activity of intestinal disaccharidases is normalized under the influence of antidotes - pectin and antioxidant - curcumins. In lead intoxication, the corrective effect of pectin on the structure and hydrolytic properties of intestinal villi is more effective than that of curcumin.

REFERENCES

1. Fukuda K. Food safety in a globalized world // Bull World Health Organ. - 2015, - V.93, № 4.- P. 212.
2. Wang Y., Harvey C.B., Hollox E.J. The genetically programmed down-regulation of lactase in children // Gastroenterology. - 1998. - V.114. - P. 1230-1236.

3. Barannikov V.D. Экологическая безопасность сельскохозяйственной продукции: Уч. posobie dlya vuzov // Kolos S. - 2005. - 350 p.
4. Berezov T. T. Biologicheskaya khimiya // OAO Izdatelstvo «Meditsina», - 2008. - 704p.
5. Vaganov P.A. As rasschitat risk ugrozy zdorovyu iz-za zagryazneniya okrujayushchey sredy: Zadachi s resheniyami // Izd. SPGU. - 2008. - 128p.
6. Gerasimenko V.P. Practicum on agroecology // Lan. - 2009. - 427p.
7. Gritsenko V.S. Bezopastnost jiznedejatelnosti // G'. M. - 2005.- 2008s.
8. Raximov K.R., Demidova A.I. Carbohydrates and mechanisms of digestion // - Tashkent, 1986. -130 p.
9. Ugolev A.M. Theory of adequate nutrition and trophology // Nauka, - 1991. - 272 p
10. Kuchkarova L.S., Qurbonov Sh.Q. Digestion and nutritional physiology. - Tashkent, Sano-standart, - 2013. - 318 p.

Websites used:

1. <http://www.fao.org/food/food-safety-quality/scientific-advice>
2. http://www.who.int/foodsafety/publications/foodborne_disease/fergarepore