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## Introduction

- Meconium formed in the fetal intestine is composed of a number of layers deposited as waste material in the intestinal lumen.
- Meconium also serves as a specific matrix for numerous proteins derived from swallowed amniotic fluid, shed fetal intestinal cells and secretions [1,2].
- Both the individual composition and the sum of particular protein concentrations (total protein) may reflect many physiological and pathological processes during the period of intrauterine development [3].

## Aim

To determine the concentrations of total protein in meconium by assessing individual variations of this parameter in serial meconium portions passed by the neonate and analyzing inter-individual differences in intestinal protein accumulation *in utero*.

## Method

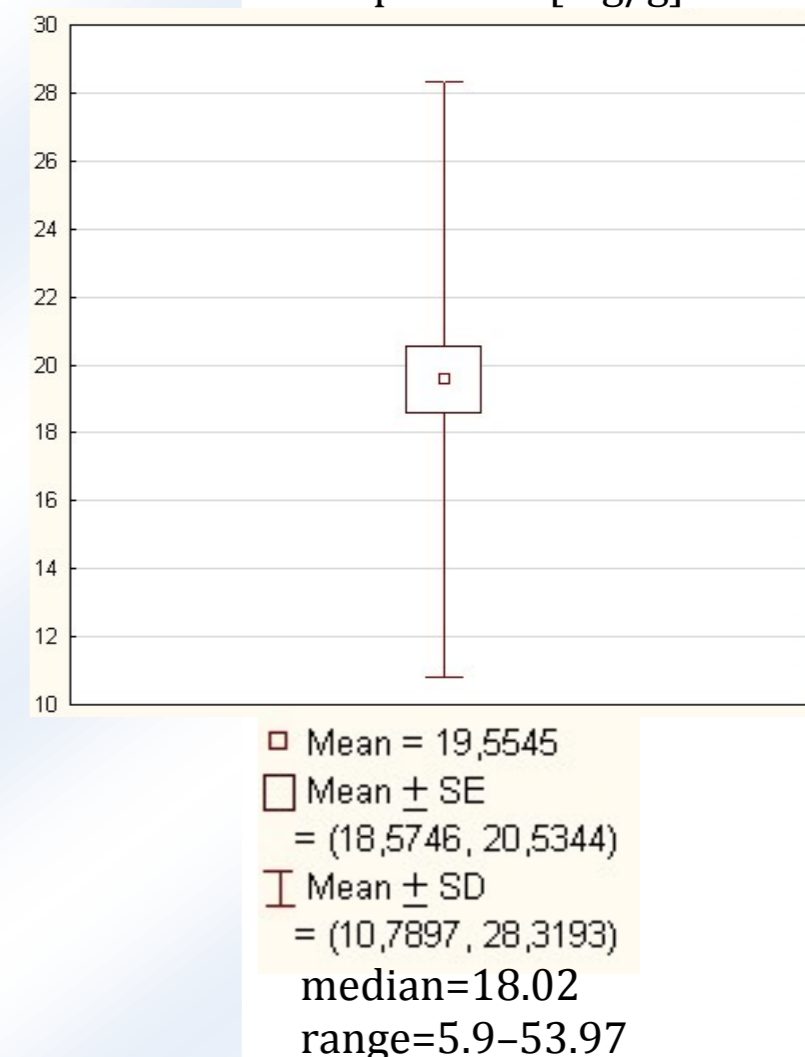
Total protein concentrations [mg/g meconium] in 80 meconium portions from 19 healthy neonates were determined by the Bradford method. Two to nine meconium portions were obtained from one neonate. The total protein content of all serial meconium portions was considered to equal the amount of total protein accumulated in the fetal intestine *in utero*.

## Results

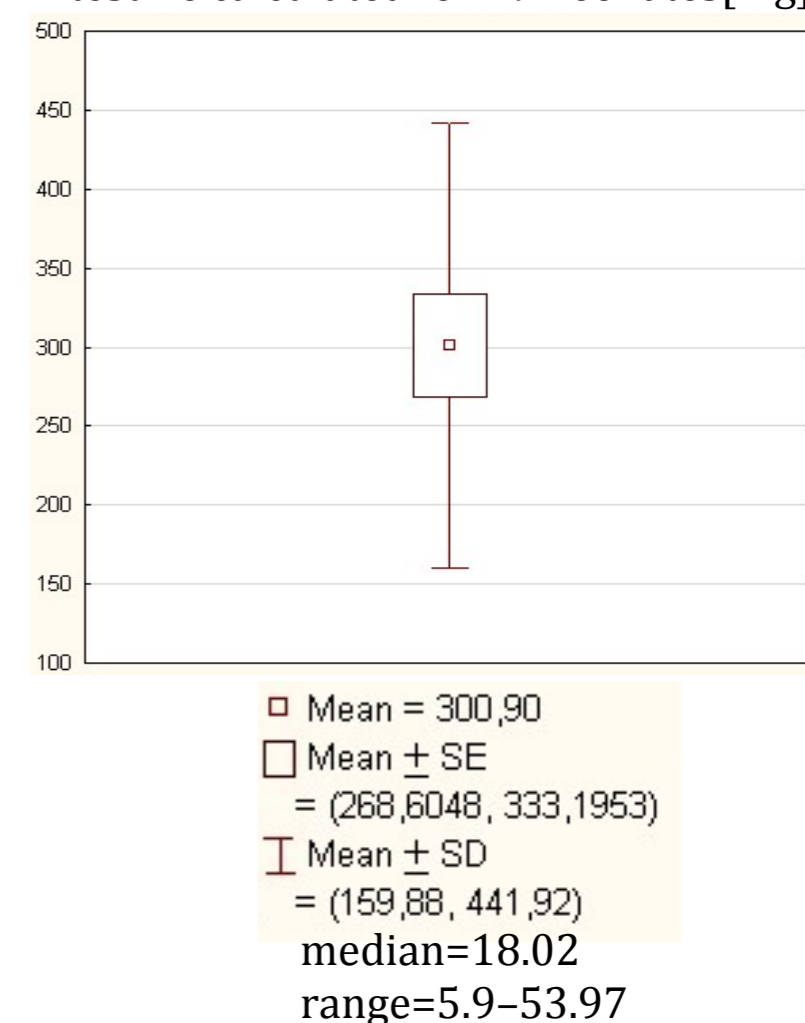
Tab. 1 Protein concentration in meconium of healthy neonates.

No.	Number of meconium / total weight	Weight meconium	Portion meconium	Protein concentration [mg/ml]	Protein concentration in meconium portion 45ml [mg]	Total protein accumulation in fetal intestine [mg]	Total protein concentration [mg/g]
1	5 / 10,533	4,502	1	1,085	48,825	157,140	10,845
		2,395	2	0,920	41,400		17,286
		0,922	3	0,406	18,270		19,816
		2,092	4	0,800	36,000		17,208
		0,622	5	0,281	12,645		20,330
2	9 / 16,069	3,287	1	0,945	42,525	317,025	12,937
		1,642	2	0,869	39,105		23,815
		2,14	3	0,655	29,475		13,773
		0,704	4	0,382	17,190		24,418
		2,017	5	0,906	40,770		20,213
		0,83	6	0,547	24,615		29,657
		3,379	7	1,774	79,830		23,625
		1,349	8	0,627	28,215		20,915
		0,721	9	0,340	15,300		21,221
3	5 / 27,36	8,038	1	3,457	155,565	581,760	19,354
		12,734	2	5,924	266,580		20,935
		3,915	3	1,887	84,915		21,690
		1,955	4	1,110	49,950		25,550
		0,718	5	0,550	24,750		34,471
4	4 / 18,519	5,407	1	2,044	91,980	256,050	17,011
		7,926	2	1,900	85,500		10,787
		1,647	3	0,645	29,025		17,623
		3,539	4	1,101	49,545		14,000
5	3 / 22,868	12,778	1	1,991	89,595	231,120	7,012
		3,379	2	0,733	32,985		9,762
		6,711	3	2,412	108,540		16,173
6	4 / 27,551	7,447	1	2,426	109,170	417,960	14,660
		10	2	2,954	132,930		13,293
		8,367	3	2,787	125,415		14,989
7	3 / 36,954	1,737	4	1,121	50,445	459,765	29,041
		16,866	1	2,957	133,065		7,890
		7,133	2	3,074	138,330		19,393
		12,955	3	4,186	188,370		14,540
8	3 / 12,279	7,915	1	1,196	53,820	141,660	6,800
		1,668	2	0,850	38,250		22,932
		2,696	3	1,102	49,590		18,394
9	3 / 19,793	8,13	1	3,198	143,910	376,650	17,701
		4,049	2	1,413	63,585		15,704
		4,07	2	2,564	115,380		28,349
		3,544	3	1,195	53,775		15,174
10	2 / 21,152	18,928	1	2,483	111,735	166,545	5,903
		2,224	2	1,218	54,810		24,645
		14,094	1	6,255	281,475		19,971
11	3 / 19,728	4,826	2	3,464	155,880	480,960	32,300
		0,808	3	0,969	43,605		53,967
		10,266	1	2,642	118,890		11,581
12	3 / 19,422	6,386	2	2,217	99,765	256,905	15,622
		2,77	3	0,850	38,250		13,809
		2,374	1	0,481	21,645		9,118
13	5 / 10,842	5,2	2	1,135	51,075	119,925	9,822
		2,259	3	0,570	25,650		11,355
		0,823	4	0,369	16,605		20,176
		0,186	5	0,110	4,950		26,613
		4,368	1	1,285	57,825		13,238
14	5 / 19,67	5,262	2	2,170	97,650	331,920	18,558
		2,836	3	1,417	63,765		22,484
		1,486	4	0,640	28,800		19,381
		5,718	5	1,864	83,880		14,669
		1,781	1	0,875	39,375		22,108
15	4 / 7,048	1,032	2	0,466	20,970	153,855	20,320
		1,453	3	0,632	28,440		19,573
		2,782	4	1,446	65,070		23,390
		7,28	1	2,353	105,885		14,545
16	6 / 34,543	6,26	2	2,165	97,425	537,435	15,563
		0,654	3	0,314	14,130		21,606
		3,86	4	1,254	56,430		14,619
		8,165	5	2,910	130,950		16,038
		8,324	6	2,947	132,615		15,932
17	4 / 8,44	1,646	1	1,230	55,350	202,590	33,627
		2,748	2	1,629	73,305		26,676
		2,444	3	1,062	47,790		19,554
		1,602	4	0,581	26,145		16,320
18	4 / 13,601	5,441	1	1,615	72,675	218,160	13,357
		6,925	2	2,822	126,990		18,338
		0,485	3	0,188	8,460		17,443
		0,75	4	0,223	10,035		13,380
		0,352	1	0,328	14,760		41,932
19	4 / 14,677	1,778	2	1,714	77,130	312,615	43,380
		0,839	3	0,910	40,950		48,808
		11,708	4	3,995	179,775		15,355

Total protein concentration in 80 meconium portions [mg/g]:



Total protein accumulation in the fetal intestine calculated for 19 neonates [mg]:



## Conclusions

- 10-fold differences between total protein concentrations in neonatal meconium confirm the heterogeneity of protein content accumulated in the fetal intestine.
- Differences in the total protein amounts accumulated in the intestine of individual fetuses may reflect the role of particular proteins in the intrauterine development.
- Assessment of total protein in meconium may be an easy and cheap to use laboratory parameter to differentiate physiological and pathological processes in the course of fetal development.