duce motor and sensory disturbances, and even death from respiratory paralysis. Traumatized spinal cord tissue is highly susceptible to the toxic action of even minute doses of bile salt in alcoholic solution although apparently resistant to the same doses in aqueous solution. Spinal fluid protein and cord tissue reduce the hemolytic action of bile salt.

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Digestibility of Gastric Mucin in vivo.

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We have previously reported studies indicating that gastric mucin (hog) is relatively resistant to enzymatic hydrolysis *in vitro*.[1] However, indirect evidence suggests more complete digestion in the gastrointestinal tract.[1] To further investigate the digestion of mucin we have fed purified gastric mucin as the source of nitrogen, to a series of albino rats, and from nitrogen analyses of the urine and feces determined its degree of digestibility *in vivo*.

Our experimental procedures differed little from those commonly employed in the determination of utilization, digestibility and biological value of proteins. Young growing albino rats weighing 40-60 gm. were placed in cages so designed that urine and feces could be collected separately. Nitrogen intake was calculated from the weight of food consumed. The small amount spilled was corrected for by determining its nitrogen content and subtracting from the calculated food nitrogen. All nitrogen analyses were by the Kjeldahl method.

The purified mucin[2] used in the preparation of the mucin diet gave the following analyses: Nitrogen 7.50%. Reduction after acid hydrolysis (Shaffer-Hartmann) 35.4% (as glucose) and ash 2.51%. The diet was designed to be complete for the rat exclusive of its protein content. This necessitated the addition of a small

[1] Anderson, R. K., and Farmer, C. J., PROC. SOC. EXP. BIOL. AND MED., 1934, **32**, 21.

[2] Anderson, R. K., Fogelson, S. J., and Farmer, C. J., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 518.

TABLE I.

Utilization and Digestibility of Gastric Mucin.

Mucin-Free Diet					Mucin-Containing Diet								
Initial Wt. gm.	Final Wt. gm.	Food Intake gm.	Fecal N. mg.	Urinary N. mg.	Initial Wt. gm.	Final Wt. gm.	Food Intake gm.	Nitrogen Intake mg.	Fecal N. mg.	Urinary N. mg.	Nitrogen Balance mg.	% Utilization	% Digestibility
							Group I.						
62	51	25	51	85	54	57	32	492	178	282	+32	63.8	74.1
49	40	23	48	64	42	43	25½	393	143	272	—22	63.5	75.7
49	42	18	39	78	44	45	26	398	151	256	— 9	62.0	71.8
54	46	20	44	76	46	47	26½	401	149	230	+22	62.8	73.8
47	42	22	41	68	44	44	25½	390	154	226	+10	60.5	71.0
53	44	23	42	69	46	48	28	429	161	254	+14	62.4	72.2
							Group II.						
42	38	16	33	62	38	36	21	320	138	221	—39	56.8	67.2
61	57	16	38	78	57	59	27½	422	159	276	—25	62.3	71.3
45	43	16	38	55	41	40	22½	343	156	211	—24	54.5	65.5
45	42	14	40	62	41	39	24½	375	162	212	+ 1	56.8	67.4

amount of yeast concentrate (Yeast Vitamin-Harris), the amount added being sufficiently small to be disregarded for practical purposes.[3] A preliminary period on a diet similar except for the absence of mucin was employed in order to determine the fecal nitrogen on a nitrogen-free diet, or the so-called metabolic nitrogen. Four-day periods were allowed between changes in diets to insure the attainment of equilibrium. Collection periods were each of one week's duration. The compositions of the diets were as follows:

Mucin Diet		*Mucin-Free Diet*	
Mucin	20%	Dextrinized starch	80%
Dextrinized starch	60%	Fat (hydrogenated cottonseed oil)	15%
Fat (hydrogenated cottonseed oil)	15%	Salt mixture (Osborne-Mendel)	4%
Salt Mixture (Osborne-Mendel)	4%	Sodium Chloride	1%
Sodium Chloride	1%		

To each diet was added yeast concentrate (Yeast Vitamin-Harris) to a concentration of 0.44% and each rat received in addition one drop of haliver oil plus viosterol (Abbott) every second day. The diets were found to contain 1.561% and 0.066% nitrogen respectively (after yeast concentrate addition).

Utilization was calculated as $\frac{\text{N intake—fecal N,}}{\text{N intake}}$ and digestibility as $\frac{\text{N intake—(fecal N—metabolic N),}}{\text{N intake}}$

The table gives data representative of that obtained in a total of 5 collection periods on 2 different groups of rats. While the digestibility was found to be somewhat lower than that reported for most animal proteins, it is considerably greater than we obtained *in vitro* and indicates that in the case of the rat at least, mucin is to a large extent digestible. It will be observed, however, that the rats failed to gain weight, nor was there significant nitrogen retention. These facts indicate low biological value. Other experiments have further confirmed the inadequacy of purified commercial gastric mucin for growth. The source of this deficiency is being investigated.

[3] Mitchell, H. H., *Phys. Rev.*, 1924, **4**, 466.