only satisfactory with purified material. Centrifuging precipitates instead of filtering facilitates protection from air and moisture, and working rapidly at lower temperatures.

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Amino Acids as Gastric Secretagogues.

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In the course of our recent studies on the secretion of gastric pepsin, we examined the effects of small amounts of amino-acids administered by the technique of Tagawa[1] to Pavlov gastric pouch dogs. The volumes of juice obtained were too small to allow accurate calculations of the total pepsin contents to be made, and the volume of secretion obtained differed greatly from that reported by Tagawa. In the present study 13 amino-acids were tested: alanine, arginine monohydrochloride, aspartic acid, cystine, glutamic acid, glutamic acid hydrochloride, glycine, histidine monohydrochloride, leucine, isoleucine, phenylalanine, tyrosine and valine.

As has been emphasized by Ivy and Javois,[2] all of the amino-acids appeared to be rather weak secretagogues with but few exceptions. Contrary to the results of Tagawa, glutamic acid hydrochloride was found in our work to be the weakest instead of the strongest stimulant for gastric secretion. All of the free acids, with the exception of isoleucine, were found to be slightly more active than glutamic acid hydrochloride. The fact that glutamic acid was a more potent stimulus for secretion than its hydrochloride is directly opposite to the findings of Tagawa.

Isoleucine, arginine and histidine were found to produce from 2 to 3 times the volume of juice excited by the other amino-acids tested. The activity of histidine in this respect is particularly interesting in view of its close structural relationship to histamine. The potency of isoleucine argues against the view that the basicity

* These data form a part of the dissertation submitted by Elizabeth R. B. Smith to the Faculty of the Graduate School, Yale University, May, 1933, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

[1] Tagawa, J., *Biochem. Z.*, 1931, **243**, 344.

[2] Ivy, A. C., and Javois, A. J., *Am. J. Physiol.*, 1924, **72**, 591.

of the other 2 active amino-acids is the chief factor upon which their secretagoguic activity depends.

These studies were conducted on 8 Pavlov gastric pouch dogs, at least 3 being used for each amino-acid studied, and 2 of the animals serving throughout the entire series of observations. Secretion was followed for 6 hours subsequent to the administration of 100 cc. portions of M/20 amino-acid solutions by stomach tube to the fasting animals. The test solutions were always given after a preliminary observation period had revealed that the gastric glands were in a resting condition.

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Meat Extractives as Stimulants for Secretion of Pepsin.

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As a result of the experiments conducted by Lobassow,[1] Sirotinin,[1] and of other workers in Pavlov's laboratory, and of the fractionation studies of Krimberg and Komarov[2] and others, the extractives of muscle have been recognized as potent stimuli for the secretion of gastric juice; their relation to the secretion of the particular component of gastric juice, pepsin, has received much less attention. We have conducted experiments on Pavlov gastric pouch dogs, using solutions of 4 different muscle extractive preparations and of 3 of these combined with starch, to determine what effect these materials might have on the secretion of pepsin. Secretion was followed during a preliminary period and then for 6 hours after administration of the test solution, and, in some cases, a second dose of the test material was given. At least 3 animals were used in the tests of each preparation and 2 were subjects throughout the entire study. Free and total acidities were titrated to the endpoints of Töpfer's reagent and of phenolphthalein respectively; total chloride concen-

* These data form a part of the dissertation submitted by Elizabeth R. B. Smith to the Faculty of the Graduate School, Yale University, in partial fulfillment of the requirements for the degree of doctor of philosophy, May, 1933.

[1] Babkin, B. P., *Die Äussere Sekretion der Verdauungsdrüsen*, Berlin, 1928.

[2] Krimberg, R., and Komarov, S. A., *Biochem. Z.*, 1926, **176**, 73; *Ibid.*, 1928, 194, 410.