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Relative amounts of insulin obtained by extraction and by perfusion of the pancreas.

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We have employed two essentially different methods for obtaining insulin from the excised pancreas of various animals: First, extraction with different media after maceration of the pancreases; and secondly, perfusion of the intact organs with various solutions. In a series of twenty-nine perfusions done during the past ten months we have purposely varied the many factors involved—such as the composition of the perfusion fluid, the temperature of the chamber containing the organs, the rate of perfusion, volume of perfusate, time of perfusion, and perfusion pressures—within wide limits in order to select the simplest method which is efficient. A comparative analysis of these various factors leads us to conclude that the simplest efficient method is that of continuous gravity perfusion with 0.2 per cent. HCl at or somewhat above body temperature (37C. to 45C.), under a pressure of 120 mm. Hg, for a period of one hour.

In determining the potency of preparations we have used a dose of two cubic centimeters of final concentrated product administered subcutaneously to normal rabbits. Blood is taken from the ear veins before the injection and again two hours after the injection. A drop of 70 milligrams in blood sugar is taken as a rabbit unit and on this basis the yield in rabbit units per kilo of pancreas is calculated.

The perfusion method appears to give about three times as much insulin (estimated as Rabbit Units) per kilo as is obtained by the extraction methods employed and gives a product which is much more easily and quickly concentrated because of the absence of the large amounts of protein and extraneous material which were obtained when extraction processes were used.

RELATIVE AMOUNTS OF INSULIN OBTAINED BY EXTRACTION AND BY PERFUSION

Number	Method of preparation	Fluid	Type	2 hr. Blood Sugar Drop (mg) in Normal Rabbit	R. U.* per kilo of Pancreas	Gms. of Pancreas per R. U.
89 (2)	Extraction	N/5 HCl—23 days (after maceration)	Ox	0.089	76	13.0
93 (2)	Extraction	N/5 HCl—18 hrs. (continuous grinding)	Ox	0.067	96	10.4
121-I (x)	Extraction	N/5 HCl 18 hrs. (continuous grinding)	Ox	0.071	100	10.0
38	Perfusion	0.1% HCl (1 hr.—gravity)	Pig	0.092	262	3.8
34B	Perfusion	Ringer's Sol. + 0.2% HCl + 5% ether (2 hours)	Pig	0.100	286	3.4
26	Perfusion	Ether—5% HCl 0.2% (2 hours)	Pig	0.104	300	3.3

*Rabbit Unit = 70 mg. blood sugar drop in two hours in a rabbit weighing two kilos.