TABLE II.

Enzymatic Hydrolysis of β-Chloroethyl Acetate and Acetylcholine.

Same method as described in Fig. 1; same enzyme preparations as in Table I. Final concentration of acetylcholine: 0.0067 M; final concentration of β-chloroethyl acetate; 0.033 M for the first three and 0.016 M for the last preparation. Q_{ACh} resp. $Q\beta_{C1A}$ give the number of microliter of CO_2 produced in 1 hour, calculated from reaction of zero order.

Source of cholinesterase	Type	Q_{ACh}	$Q\beta_{C1A}$
Erythrocytes (human) purified	e	669	249
Snake venom (Naia melanoleuca)	e	540	129
Plasma (human)	s	405	39
Parotid (guinea pig)	s	711	72

split this ester (Table II).

Detailed information about methods and enzyme and substrate preparations will be given in an extensive publication.

Conclusions. The ability to hydrolyze noncholine esters can no longer be used as a criterion to distinguish the two cholinesterase types, since both groups of enzymes are able to split noncholine esters; for example, ethyl chloroacetate. Another noncholine ester, β-chloroethyl acetate, is even preferentially attacked by the e-type ("true" or "specific" ChE).

The use of eserine to decide whether a hydrolysis is catalyzed by a cholinesterase or another esterase is of limited value, because the s-type ("pseudo" or "unspecific" ChE) is inhibited by this substance only in the presence of acetylcholine, but not in that of ethyl chloroacetate. The e-type is inhibited in both cases.

Ethyl chloroacetate plus eserine and β-chloroethyl acetate can be used as new means of distinction of the two groups of cholinesterases.

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Variations in the Vitamin B_{12} Content of Selected Samples of Pork and Beef Muscle.*

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In a recent paper[1] a fairly quantitative assay procedure for a growth factor in liver preparations was described. This assay procedure involves placing rats on the basal ration for a 2 week depletion period and following the growth response during another 2 week period when the material to be tested is given. Further work has shown that crystalline vitamin B_{12} will give a quantitative response in this assay (Fig. 1).

Henderson *et al.*[2] have reported wide variations in the ability of pork muscle, when fed to female rats as the source of protein, to produce normal lactation. Less than one-third of the young were reared in certain experiments; however, in other experiments the lactation was comparable to that obtained with rations containing beef. Beef-fed rats

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1 Register, U. D., Ruegamer, W. R., and Elvehjem, C. A., *J. Biol. Chem.*, in press.

2 Henderson, L. M., Schweigert, B. S., Mozingo, A. K., and Elvehjem, C. A., *J. Nutrition*, 1948, **36**, 479.

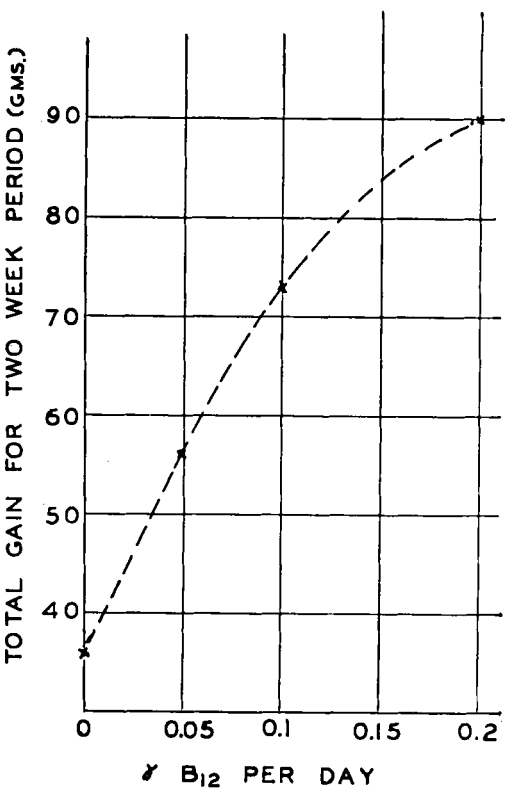

FIG. 1.
Response of rats receiving graded levels of B_{12}.

usually reared 80 to 90% of the young. The wide variations encountered when pork was fed as the source of protein led to the testing of samples of beef and pork by this new assay method for B_{12} activity.

A commercial liver preparation, assayed for vitamin B_{12} content by means of rats using crystalline vitamin B_{12} as a standard, was used as a reference. One USP antipernicious anemia unit of liver preparation was found to contain approximately one microgram of vitamin B_{12}.

These results show that the beef samples contain twice as much B_{12} as the normal pork sample while the abnormal pork sample contains only a trace or no B_{12}. The results given for the meat samples are minimum values since they are compared with B_{12} which was injected intraperitoneally. The wide variation in the B_{12} content of pork samples is significant in that it may offer an explanation for the variations in the ability of pork samples to produce normal lactation in female rats reported by Henderson and coworkers.[2]

The variable results with pork are not surprising since swine, being monogastric animals, may not be supplied with ample quantities of B_{12} and possibly other factors which may be produced by the microorganisms in the rumen of cattle.

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Daily supplement	Total avg gain (g) two wk	Min. B_{12} (γ) per 100 g of sample
None	36	—
5 g beef, round steak (Sample 1)	74	2
5 g beef, round steak (Sample 2)	74	2
5 g pork, shoulder (normal)*	56	1
5 g pork, shoulder (abnormal)†	39	Trace
0.1 USP. unit Reticulogen (Lilly)‡	74	2000§

* From sow that lactated normally.
† From sow that showed abnormal lactation (young died after birth).
‡ Injected intraperitoneally.
§ Contains approximately 1 γ B_{12} per USP unit.