NMR scans demonstrated that liquid oils were not present. However, petroleum ether and carbon tetrachloride extractions removed fats. In addition, fatty acid and amino acid analyses were made by GLC and automatic amino acid analyzer. Kjehldahl nitrogen determination also was made.

Fatty Acid	% Peruvian Sample	% Ill. Hi. Oil
Myristic C_{14}	1.54	Trace
Palmitic C_{16}	31.28	11.5
Palmitoleic $C_{16:1}$	1.92	0.4
Stearic C_{18}	4.78	1.8
Oleic $C_{18:1}$	51.67	33.0
Linoleic $C_{18:2}$	8.78	50.0
Linolenic $C_{18:3}$	0.0	0.2
Total oil (Gravimetric)	1.7	15
Protein	7.8	15

If one assumes that the Peruvian sample was originally similar to modern corns in fat content and quality, it is apparent that the disappearance of linoleic acid over time was more pronounced than for other fatty acids.

Traces of short chains and other breakdown products were also observed.

Amino acid analyses are incomplete, but short column analysis suggests that lysine level was not different from ordinary corns.

D. E. Alexander
Ian de la Roche
Dennis Elmore
Floyd Collins
Ralph Rodgers

3. Lysine content of Peruvian floury varieties.

Nineteen Peruvian highland and selva floury varieties were selected from the germ-plasm bank maintained by the Programa Cooperativo de Investigaciones en Maize at LaMolina. Varieties were selected on the basis of phenotypic

similarity to opaque-2 or floury-2. Lysine content was determined by short column method on an automatic analyzer. All varieties were found to be similar to ordinary corns. (List and analytical data available on request).

D. E. Alexander
C. D. Elmore

4. Inheritance of palmitic acid.

A study of the level of palmitic acid was made during the summer of 1967. K6 (11.28% palmitic acid) and H51 (16.01% palmitic acid) inbreds were used to produce F_1, F_2, BC to K6 and BC to H51. All analyses were run on single kernels by G.L.C., 456 analyses in all.

The results of analysis of BC to K6, BC to H51 and F_2 were tested against a single gene hypothesis by Chi square. This was rejected as probability approached zero.

The data, when plotted in histograms, appeared to approach a normal distribution; portioning of variance by Mather's formulae yielded an additive genetic variance 2.4 times as large as the dominance genetic variance. Heritability was .83, suggesting that C16 is under direct gene control.

The F_3 generation of this cross is now being analyzed so that an estimate of the number of genes controlling palmitic acid can be made. Other populations are also being prepared for analysis to provide supporting evidence for a genetic model.

R. J. Swieringa
D. E. Alexander

5. Location of fl_2.

(a) Preliminary crosses which included T 4-9g (4S.27; 9L.27) and T 4-9 5657 (4L.33; 9S.25) confirmed the location of fl_2 on Chromosome 4.

$$\frac{Wx \quad + \quad fl_2}{wx \; T \; 4\text{-}9g \; +} \quad X \quad wx \rightarrow \quad 149 \; \underline{Wx} \; \underline{Fl}/1304 = 11.42 \times 2 = \text{estimated } 22.8\% \; \underline{wx}\text{-}\underline{fl_2} \text{ recombination}$$

$$\frac{Wx \quad + \quad fl_2}{wx \; T \; 4\text{-}9 \; 5657 \; +} \quad X \quad wx \rightarrow \quad 32 \; \underline{Wx} \; \underline{Fl}/371 = 8.6 \times 2 = \text{estimated } 17.2\% \; \underline{wx}\text{-}\underline{fl_2} \text{ recombination}$$

Ears from the above crosses were scored for percentage of non-waxy, non-floury kernels among the total ($\underline{fl_2}$ $\underline{fl_2}$ $\underline{Fl_2}$ endosperms are usually floury in phenotype). Since these represent only one of the two recombinant types, the percentages thus obtained were doubled to arrive at an estimate of total $\underline{wx}$-$\underline{fl_2}$ recombination.