then the refining and margarine manufacturing trade would have problems since the finished product would have to be imported from other EEC countries. The ban has been lifted but the Italian government have put the case before the EEC. Germany has also backed the Italian move since it had experienced similar problems of imported tank car deliveries of edible oil. It is clear that if EEC legislation was made effective then all shipments would immediately have to be dedicated.

FOSFA and the shipowners have since met and it is hoped that by the end of March a programme of action will be proposed. Dedicated tank space for edible oils and fats is going to be required in a relatively short time, but it is the period of time which will be allowed for the shippowners to arrange suitable dedicated shipping. We believe that it will be necessary for new storage capacity to be built certainly in Europe in order to maintain larger stocks of edible oils due to possible reduction of available ships. In this interim period FOSFA and the shippers will have made further modifications to their contracts in order to show both to customers and governments that everything possible is being done to speed up the requirement of dedicated shipping without upsetting normal trade.

In the meantime, research and development will continue to improve quality standards for shipment and storage so that the best quality product can arrive at the consumers.

Marshall Pike
(Condensed by Dr. Elias Awang)

PRESS STATION AND PRESS CAKE ANALYSIS

Results of project reports on press station/press cake analysis submitted by the participants of 10th Palm Oil Mill Engineers Training Course organised by PORIM were analysed and summarised.

Methodology

One press was selected from each mill and the following programme was carried out hourly for 8 hours.

i. Note and record the level of fruits in the digester.

ii. Note and record the temperature of the digested fruits leaving the digester.

iii. Note and record the press screw speeds.

iv. Note and record the power being absorbed by the press driving motor.

v. Measure and record the temperature of the cake leaving the press discharge cone.

vi. After making sure that all the nuts are retained, 2 kg of press cake were taken and the followings parameters were analysed:-

a) Fibre to nut ratio

b) % cracked nuts in cake

c) % free and broken kernels in cake

d) % shell in cake

vii. A representative sample of fibre from the press cake was taken and determined for % oil, % water and % non - oil solids (NOS).

viii. A representative sample of whole nuts from the press cake was taken. The shell to kernel ratio and moisture content of the kernels were determined.

Results

The operation of press station as reported by the course participants was summarised in *Table 1*. Results of press cake and press fibre analysis are shown in *Tables 2* and *3* respectively. The weight percentage of shell and kernel was found to be 49 and 51 respectively with standard deviation of 3.6. The frequency distributions of cracked nuts in press cake and oil loss in press fibre on NOS are shown in *Figures 1* and *2* respectively. The average percentage of cracked nut in press cake and the respective oil content in press fibre of each mill are plotted in *Figure 3*.

Observations

i. The mean speed of screw presses used among the 25 oil mills was 12 RPM. Although the speed varied from 9 to 17 RPM, and there were many makes of presses, most of the most presses were running at 10 - 13 RPM

ii. The mean fibre/nut ratio was 51.8/48.2. However, the variation of the ratio between different mills was rather wide.

iii. The precentage of cracked nut in press cake ranged widely from 1.7 to 34.4% although the mean value was 9.5%. Similarly the broken nuts to total nuts also ranged widely from 6.6 to 70% with a mean value of 22.1%. The frequency distribution on percentage of cracked nut in press cake as shown in Figure 1 indicates that only about 50% of the mills were having 7.5% or less of cracked nuts in press cake.

iv. The average oil loss in press fibre among the mills was 8.3% on NOS. The variation of losses was comparatively narrower ranging from 5.7 to 13.2%. The frequency distribution as shown in Figure 2 indicates that 92% of the mills were having 10% or less oil loss in

press fibre. This was comparable to the 10% control limit recommended by PORIM milling certificate of competency scheme.

v. There seems to be a limit in reducing the oil loss in press fibre. Figure 3 indicates that squeezing the press cake harder did not neccessarily reduce the oil loss in press fibre although it may result in more cracked nuts in the press cake. The trends as shown in *Figure 4* indicate that mills A, C and D which had % Broken nuts/Total nuts (BN/TN) varying from 10 to 25% were having oil losses in press fibre varying from 6 to 12% respectively. Similarly, mill B which had BN/TN varying from 20 to 47% was also having a similar range of oil loss in press fibre during the 8 hours operation. The overall results suggest that if it is not possible to control the amount of cracked nuts in press cake at less than 7.5% in order to maintain minimum oil loss in press fibre, the maximum allowable level should not be more than 10%. If the oil loss in fibre is still high, it could be due to other factors such as improper digestion and sterilization.

(Dr. Leong Wan Leong)

Table 1. Summary on Press Station Operation based on 25 Oil Mills

	Mean	S.d	Range
Temperature at digester, °C	91.3	4.4	81 - 97.5
Speed of screw, RPM	11.8	1.7	9 - 17
Power absorbed by Press Motor			
AMP			28 - 40
KW			11.5 - 27
Temperature of Press Cake, °C	89	9.9	55 - 100

Note: Make of Screw Presses :
12 UM Dewecker P9
13 others (Stork & Locally made)

Table 2. Press Cake Analysis (25 Oil Mills) on Weight Basis

	Mean	S.d.	Range
Fibre (%)	51.8	3.25	46 - 59
Nut (%)	48.2	3.25	42 - 54
Cracked Nut in Press Cake (%)	9.51	6.9	1.7 - 34.41
Free & Broken Kernel (%)	2.91	1.6	0.9 - 7.28
Free shell (%)	1.43	1.52	0.15 - 6.3
% Broken Nuts to total Nuts	22.10	12.7	6.6 - 70.0

Table 3. Press Fibre Analysis (25 Oil Mills) on Weight Basis

	Mean	S.d.	Range
Moisture (%)	38.7	2.76	33.8 - 57
Oil in Fibre on wet basis (%)	4.57	0.91	3.5 - 7.6
% Oil in Fibre on NOS	8.3	1.65	5.72 - 13.2

Moisture of Kernel : 20.2%
S.d. : 2.24
Range : 14.8 - 25.8

Nut Analysis:
% Shell : 49, s.d. : 3.6, Range : 43-59
% Kernel: 51, s.d. : 3.6, Range : 41- 57

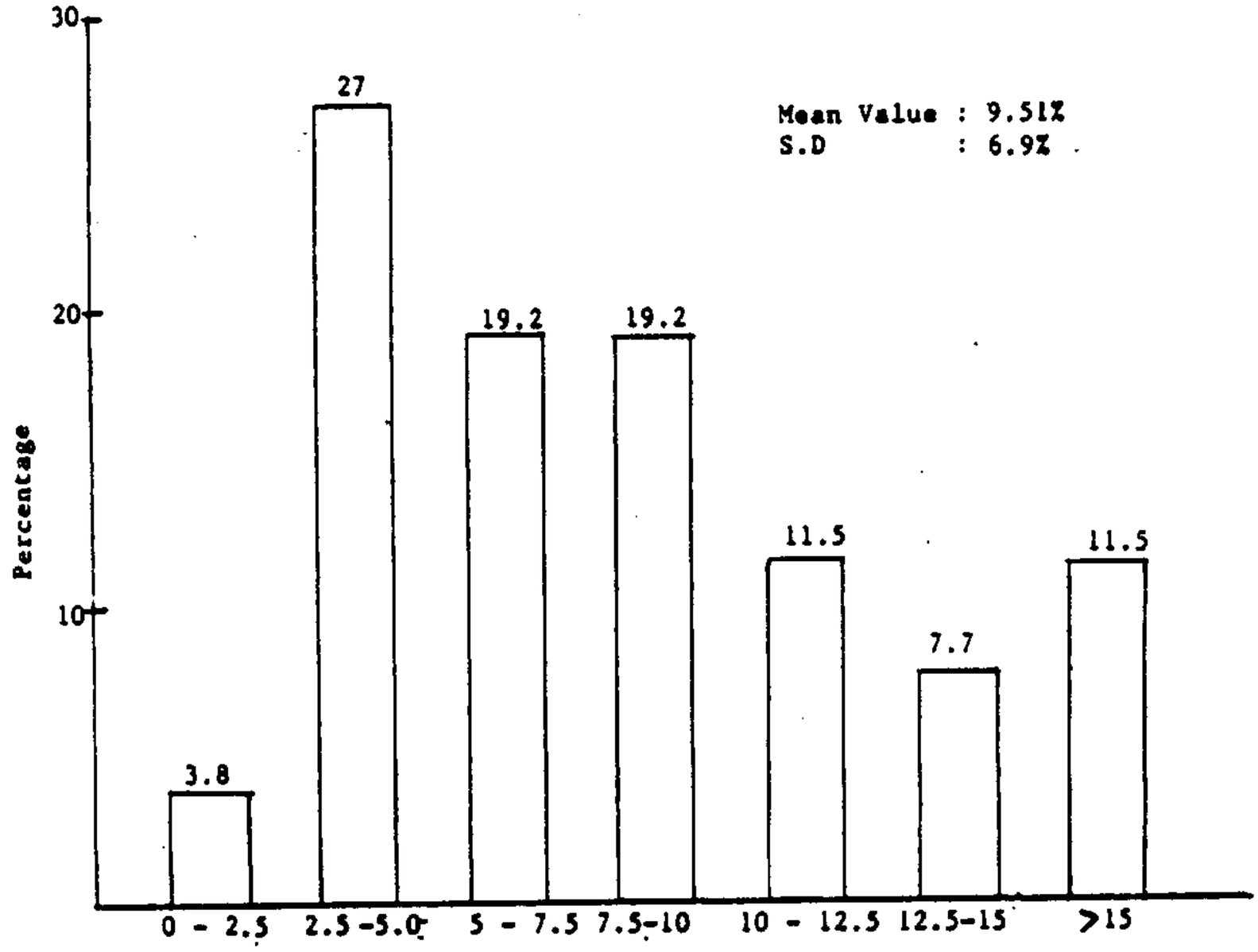

Fig. 1 Frequency Distribution of % Cracked Nuts in Press Cake (No. of Mills: 25)

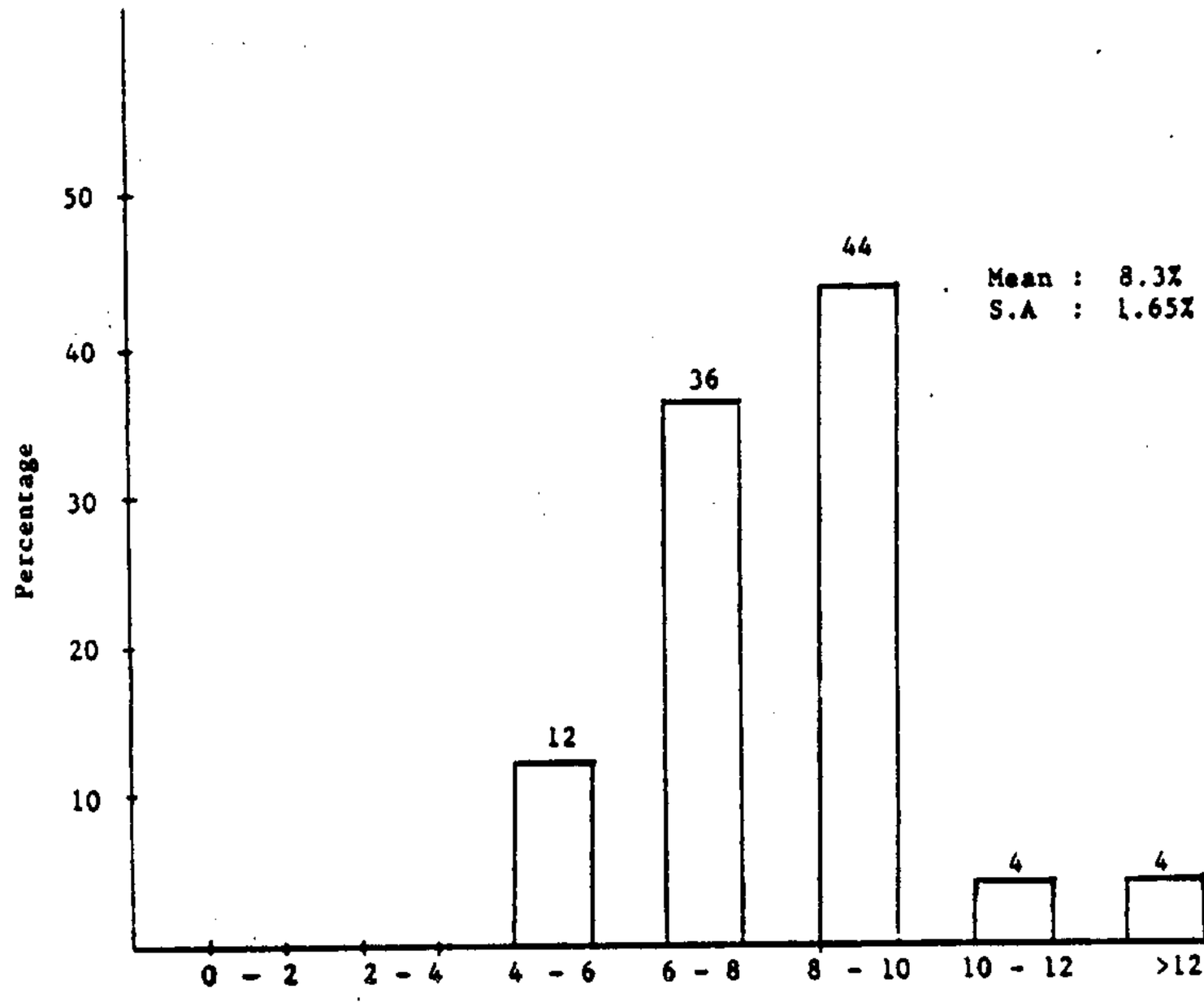

Fig. 2 Frequency Distribution of Oil Loss in Fibre on NOS (No. of Mills : 25)

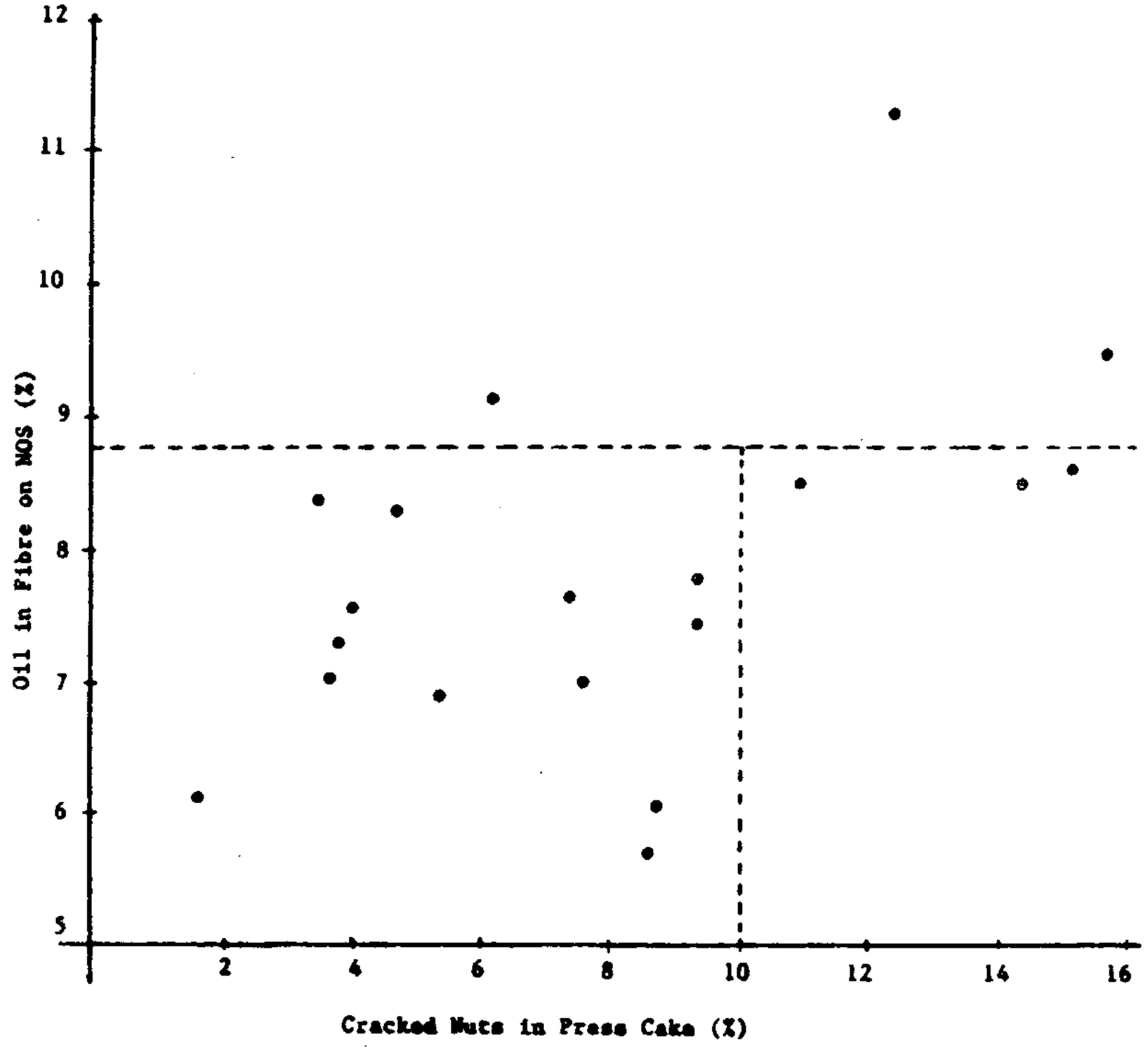

Fig. 3 Cracked Nuts in Press Cake and the Respective Oil Loss in Fibre

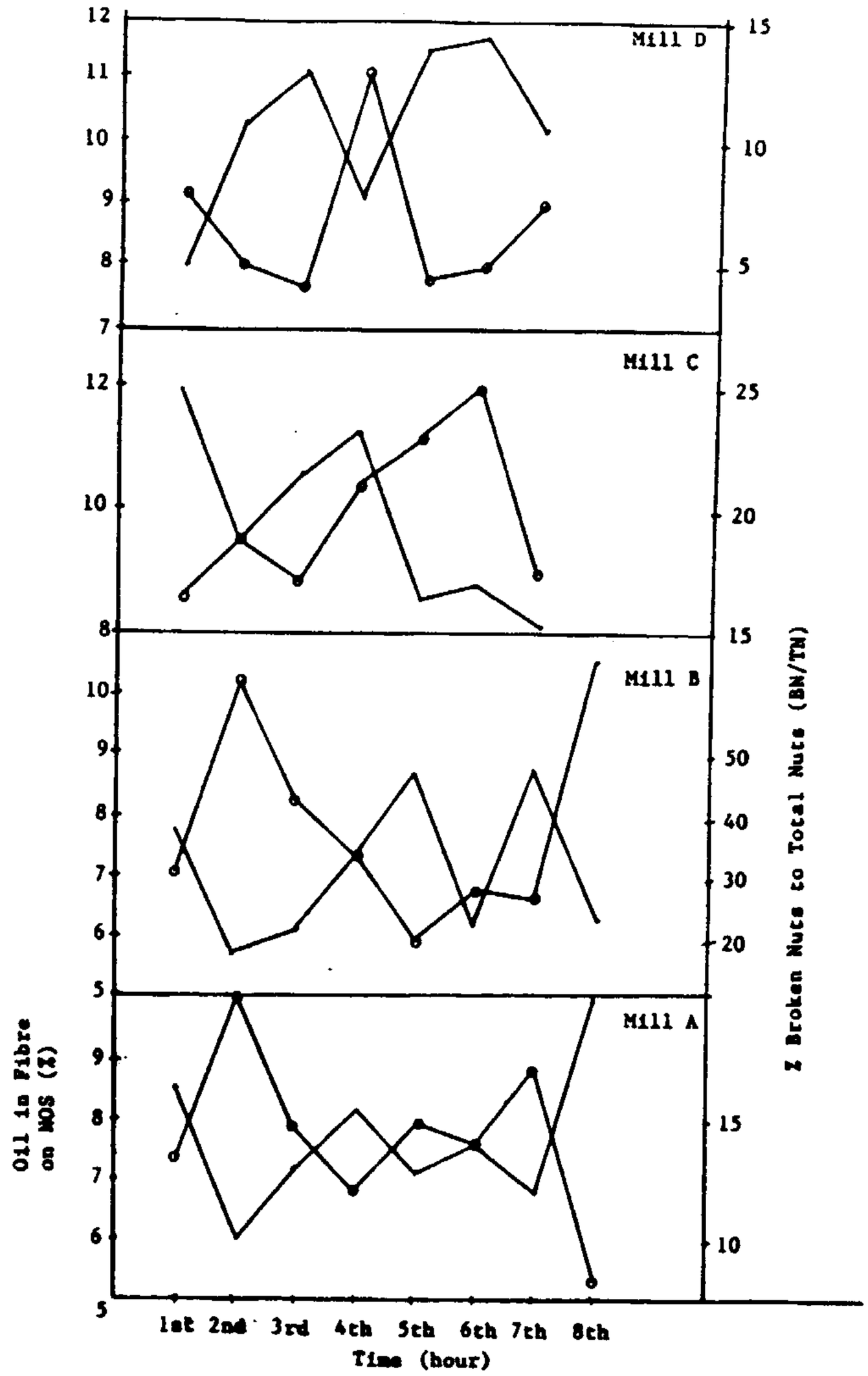

Fig. 4 Oil Loss in Press Fibre and Percentage of Broken Nuts to Total Nuts.

(o———o : Oil in Press Fibre, . ——— . : BN/TN)