

UTILIZATION AND NUTRITIVE VALUE OF TRADITIONAL WEANING GRUELS IN RURAL CONGO.

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ABSTRACT

A national survey was conducted in 1989 in the rural Congo on a representative sample of less than 2-year old children. The purpose of this survey was to characterize weaning practices and to collect gruel samples in order to determine their dry matter, crude protein and sucrose contents. 61% of children started to consume gruels before the age of 3 months and 43% stopped before the age of 6 months. Only 27% was given more than two gruels per day. 12% of gruels were made with imported weaning food. Gruels prepared with local foods were mainly maize (53%) and cassava (25%) based dough. In more than 90% of gruels, sucrose and water were the only others constituents. Chemical analysis of collected samples showed that average dry matter content (DMC) of both maize and cassava based dough were about 15 g/100g of gruel (corresponding to a energy density of about 60 Kcal/100g) with less than 5% of gruels having a DMC greater than 25g/100g. Average crude protein content of cassava and maize based gruels were respectively 1.7 and 5.4 g/100g on a dry weight basis (DWB). Average sucrose content was 37g/100g DWB in maize based gruel and 28g/100g DWB in cassava based gruel. In conclusion, traditional gruels are introduced and stopped too early. Their nutritive value is too weak in regard to their low daily frequency of consumption. Poor quality and inappropriate utilization of gruels is probably an important etiological factor of malnutrition in rural Congo.

INTRODUCTION

In rural Congo, a national nutrition survey carried out in 1987 on a representative sample of preschool children has established that stunting and wasting affected 27.6 and 5.5 % of children, respectively (1).

In view of the fact that malnutrition appears after 6 months when complementary foods have been introduced in infant feeding, a second national survey was conducted in 1989 to assess infant weaning practices and the nutritive value of gruels.

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METHODS

Data on utilization of traditional weaning gruels have been obtained by questionnaire during a transversal survey on a representative sample of 900 mothers of less than 2-year old children.

Gruels samples were collected among 342 of the 360 children who consumed gruels at the time of the survey. Samples were stored in pre-weighed polyethene screw-capped bottles containing 20 ml of 0.1% Na₂N solution to prevent micro-organism development. These were deep-frozen within a two-week delay, freeze-dried and ground to pass through a 0.5-mm sieve. Dry matter content of gruels was determined by computing weight losses during freeze-drying and complementary draft convection oven drying. Crude protein content was estimated using the micro-Kjeldahl method and sucrose was determined using high performance liquid chromatography (HPLC) techniques.

RESULTS

1. Gruel utilization

61% of the children started to consume gruels before the age of 3 months and 43% stopped before the age of 6 months (Figure 1). Gruel consumption but not breastfeeding decreased markedly after 6 months (Table 1). During the period of consumption, the daily frequency of gruel intake was low as only 27% of infants were given more than two gruels per day.

2. Gruel composition

A low percentage of gruels (12%) were prepared with imported weaning foods. However, gruels were obtained from local foods which were mainly maize (53%) and cassava (25%) based dough (Table 2).

In more than 90% of the gruels, sucrose and water were the only other constituents. Only 6% of the gruels were incorporated by powder or concentrated milk, peanut paste or other local products.

3. Nutritive value of gruels

Chemical analysis of the collected samples showed that average dry matter content (DM) of both maize and cassava-based dough were about 15 g/100g of gruel (corresponding to an energy density of about 60 Kcal/100g) with less than 5% of the gruels having a DM greater than 25g/100g (Figure 2).

Average crude protein content of cassava and maize-based gruels were 1.7 and 5.4 g/100g, respectively on a dry weight basis (DW) (Figure 3).

Average sucrose content was 28 g/100g DW with more than 40% of the gruels being constituted by at least 1/3 of commercial sugar (Figure 4).

Cassava-based gruels have significantly higher dry matter content, smaller crude protein and sucrose contents than the maize-based gruels (Table 3).

CONCLUSION

In conclusion, traditional gruels were introduced and stopped too early. Their energy and protein density were too low, with regards to their low daily frequency of consumption. The rate of incorporation of commercial sugar is generally too high.

This study sustains the hypothesis that poor quality and inappropriate utilization of gruels is probably an important etiological factor of malnutrition in rural Congo.

- (1) CORNU A., DELPEUCH F., SIMONDON F., TCHIBINDAT F. and al. (1990).
Enquête nationale sur l'état nutritionnel des enfants d'âge préscolaire au Congo.
Paris: Orstom éditions, Collection études et thèses, 338 pages.
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TABLE 1: Period and frequency of gruel utilization in rural Congo

| | 4 and 5 months | 6 and 7 months |
|---------------------------------------|-----------------------|-----------------------|
| Already weaned | 2.2 % | 3.1 % |
| Gruel consumption: | | |
| - daily | 69.4 % | 22.0 % |
| - occasional | 8.2 % | 12.0 % |
| - stopped | 20.7 % | 64.0 % |
| - never started | 1.5 % | 2.0 % |
| Daily frequency of consumption | | |
| - once | | 11.3% |
| - twice | | 61.7% |
| - thrice or more | | 26.3% |

**TABLE 2: Composition of weaning gruels
in rural Congo**

| | |
|--|---|
| <p>Main ingredient:</p> <ul style="list-style-type: none"> - Imported cereal flour - Local products: <ul style="list-style-type: none"> - corn - cassava - others | <p>11.5 %</p> <p>88.5 %</p> <p>47.2 %</p> <p>21.8 %</p> <p>19.4 %</p> |
| <p>Others ingredients:</p> <ul style="list-style-type: none"> - sugar - powder or concentrated milk - Peanut paste - other local products | <p>85 %</p> <p>6 %</p> <p>6 %</p> <p>6 %</p> |

**TABLE 3: Comparison of chemical composition
of cassava and maize-based gruels**

| | Maize based gruels | Cassava based gruels | Level of significance⁽¹⁾ |
|---|-------------------------------|---------------------------------|--|
| <i>Number of samples analysed</i> | 175 | 131 | |
| Dry matter content (g/100g gruel) | 14.4 ± 4.7 | 15.3 ± 4.8 | P < 0.05 |
| Crude protein content (g/100g dry weight) | 5.11 | 1.70 | P < 0.001 |
| Sucrose content (g/100g dry weight) | 31.8 ± 14.7 | 27.0 ± 15.7 | P < 0.05 |

Mean ± standard deviation

(1) Mann-Whitney rank-sum test

Age at starting and stopping gruel consumption

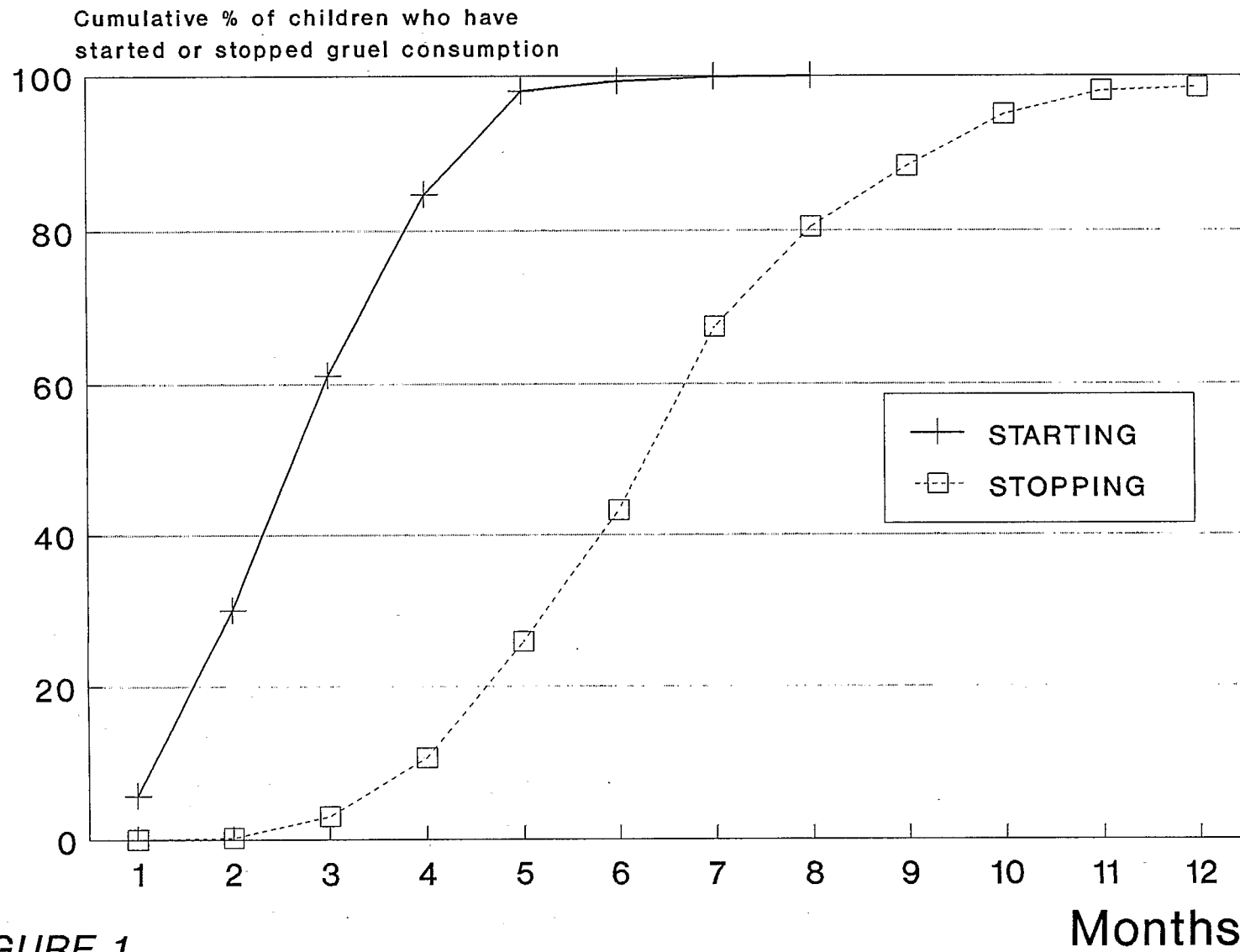


FIGURE 1

Distribution of dry matter content of gruels

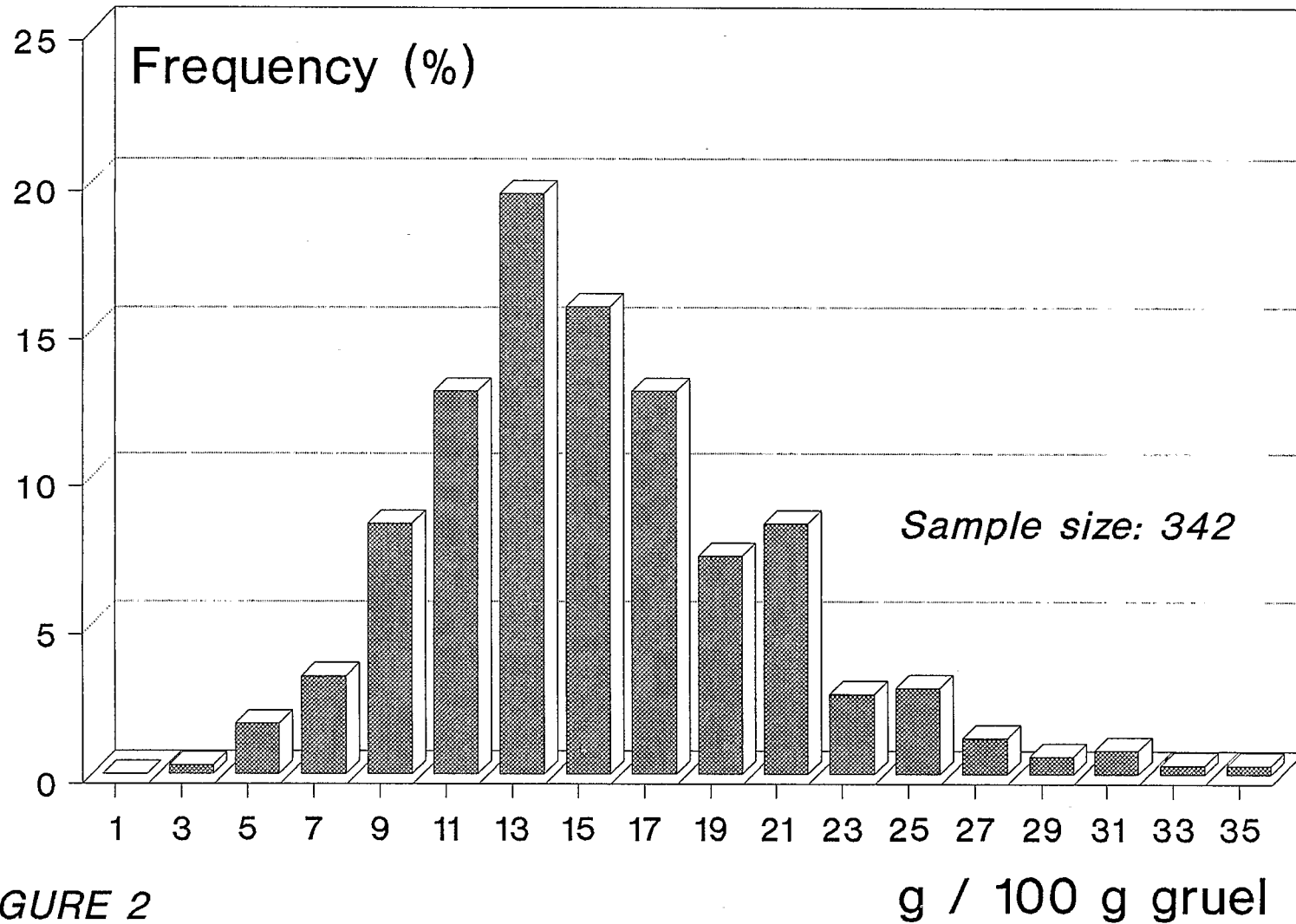


FIGURE 2

Distribution of crude protein content of gruels

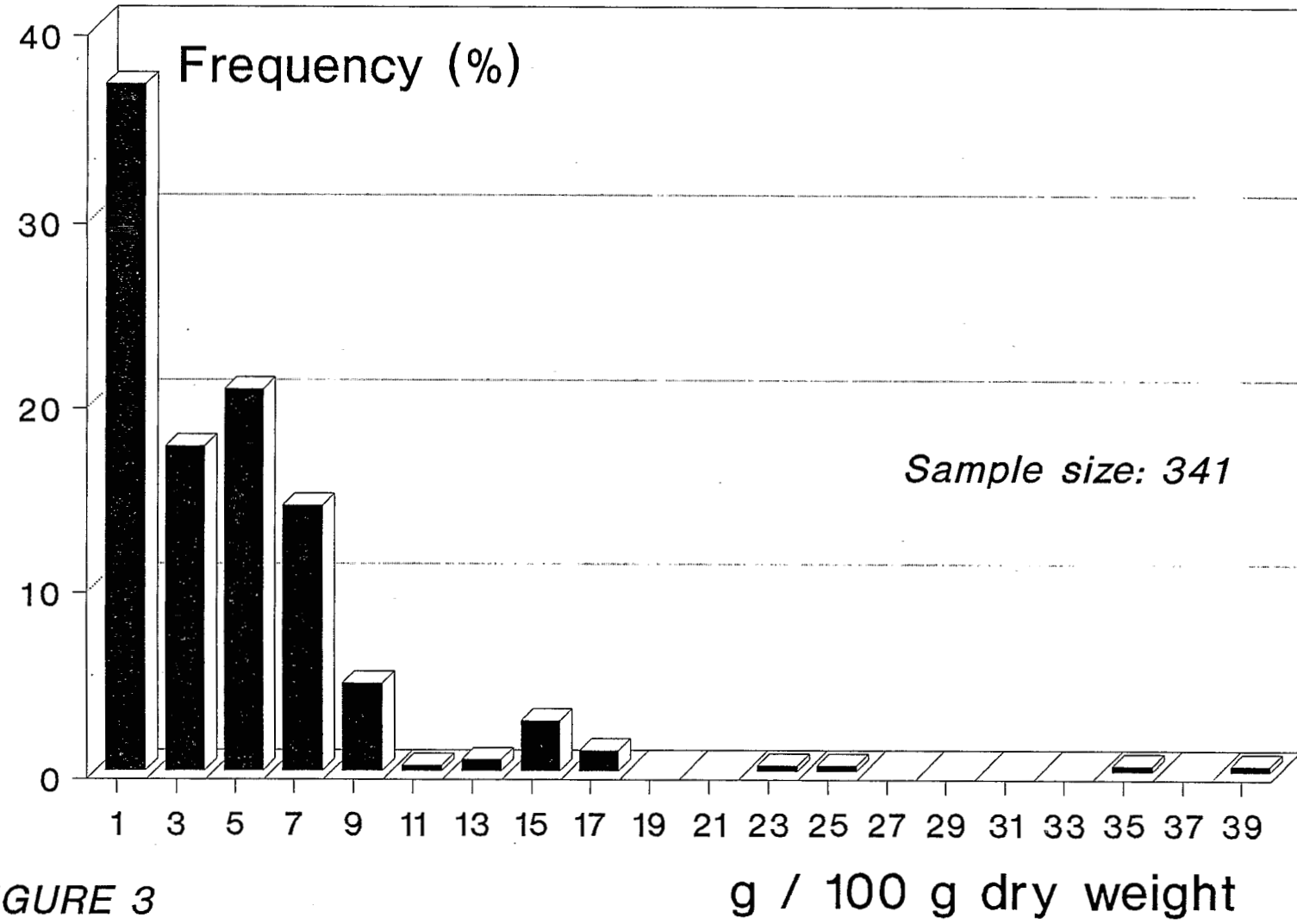


FIGURE 3

Distribution of sucrose content of Gruels

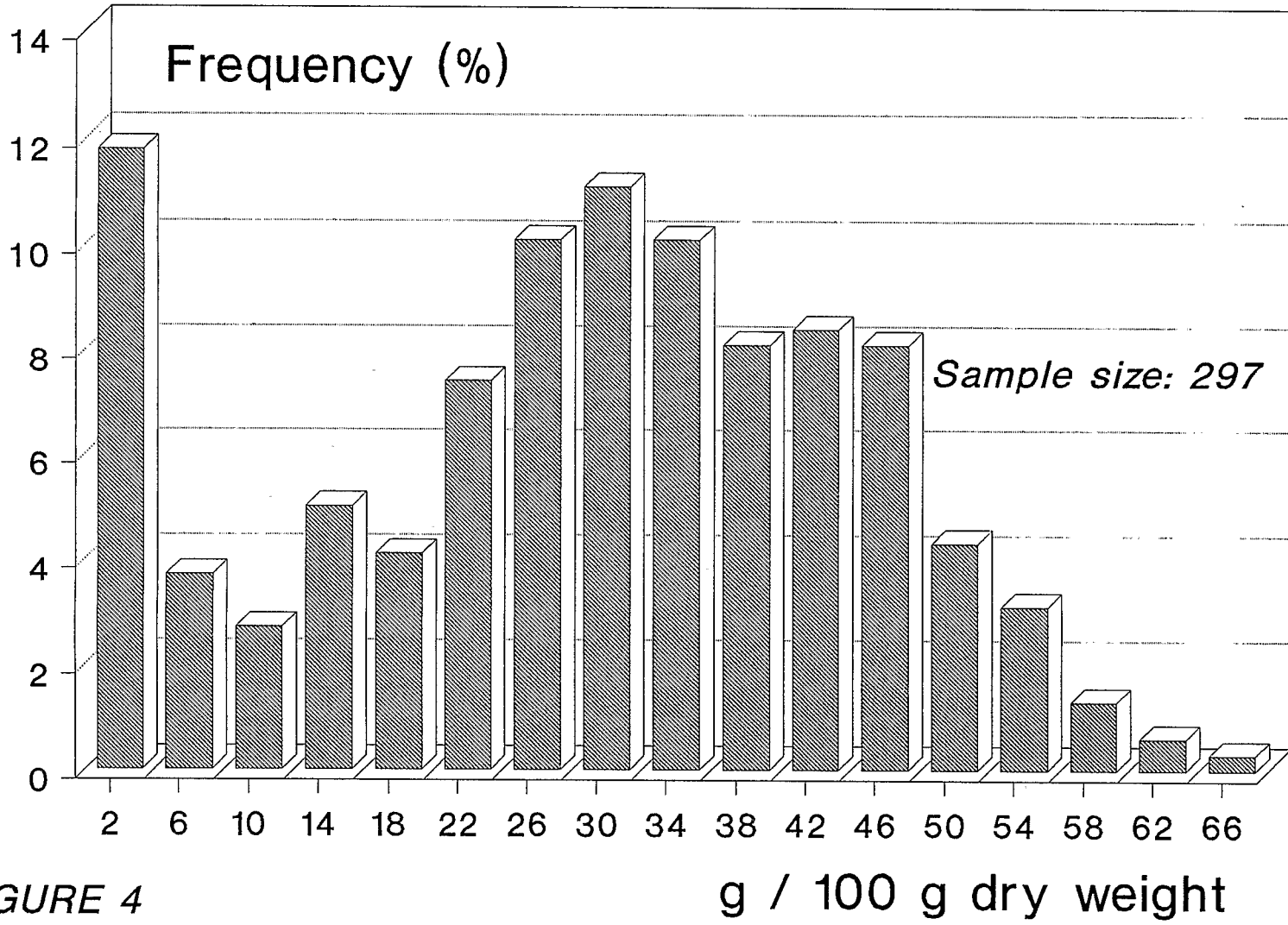


FIGURE 4