## OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.


## DISCLAIMER



## FAIR USE POLICY

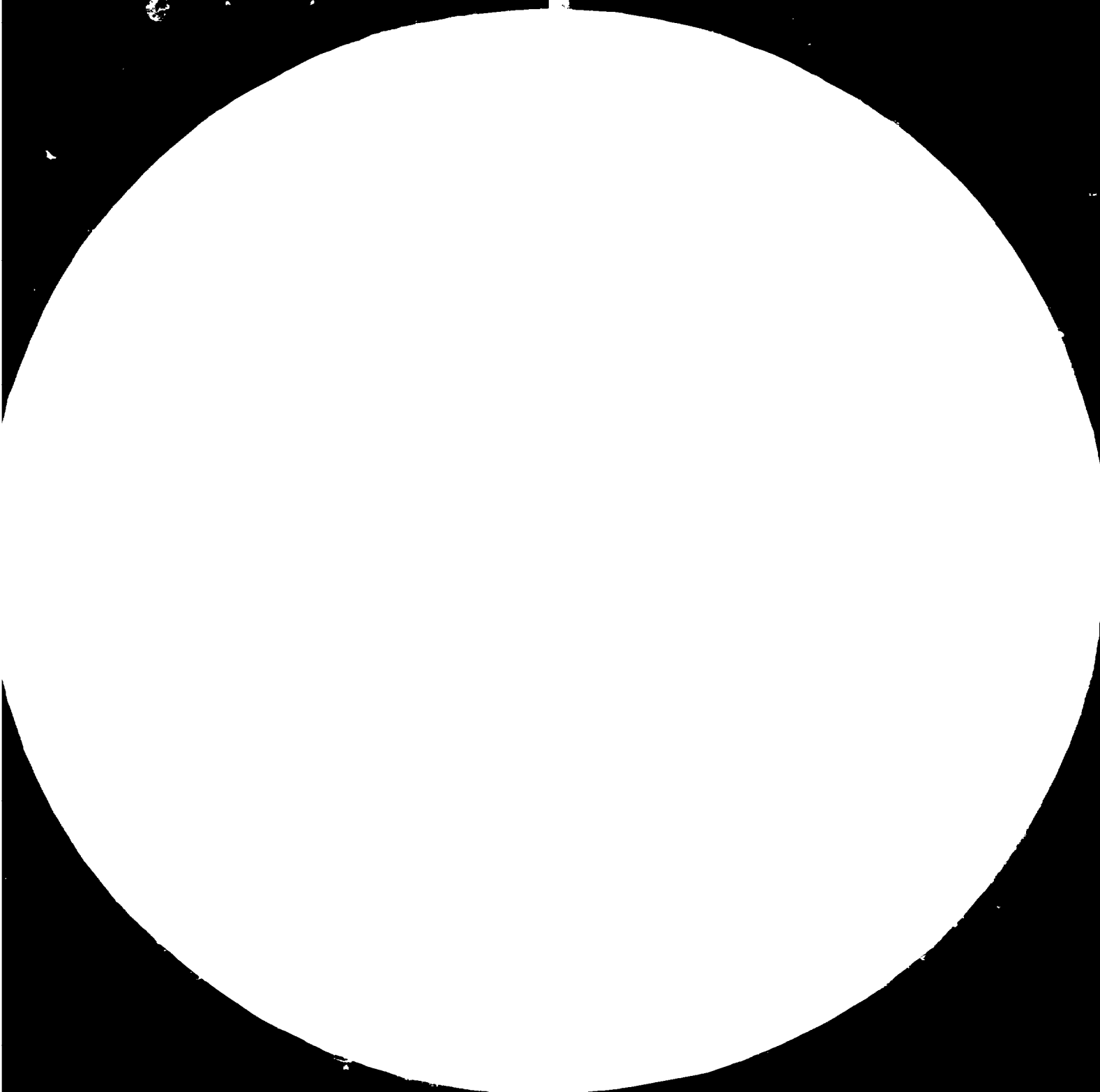


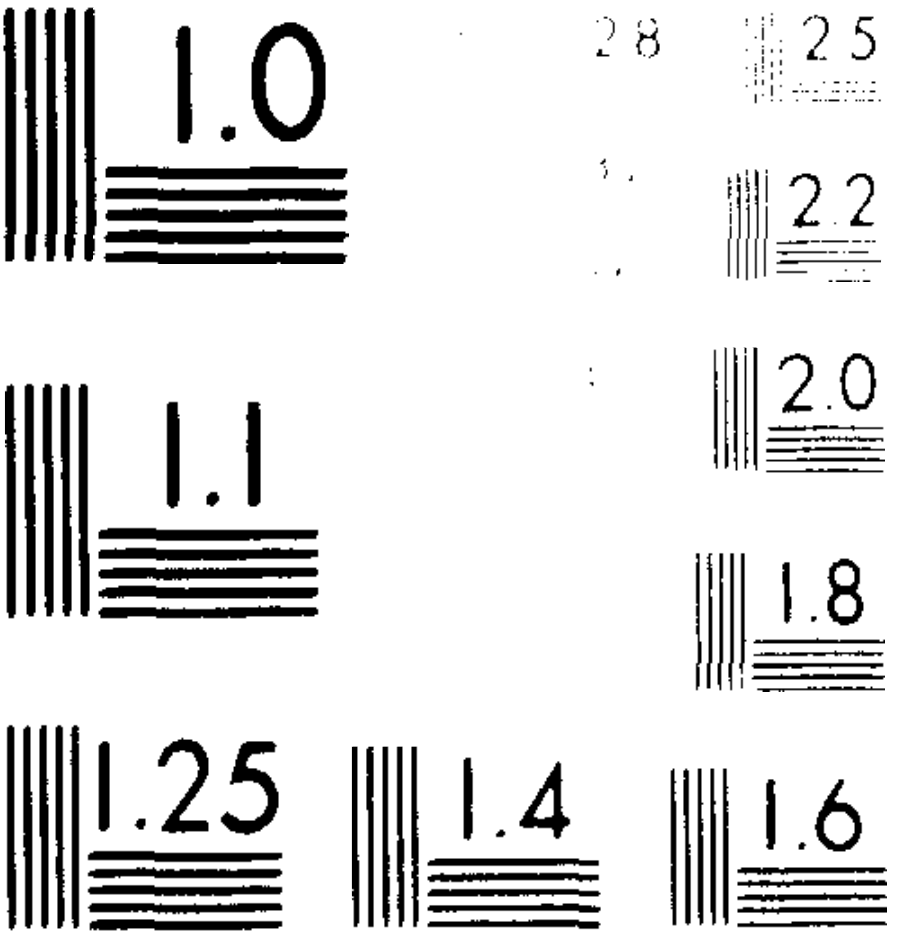
## CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org




1.0
2.8
2.5
2.2
1.1
2.0
1.8
1.25
1.4
1.6

Y. de DIESBACH
La Posada
B.P. 1510
McALLEN 78501 TEXAS

Paris, October 30 1982

12351

U. N. I. D. O.
Doctor GARDELLIN

**El Salvador. Bacteriological and fermentation trials , using locally available raw materials, for production of animal feed.**
**DP/ELS/78/001**

ATTENTION MP. Marco KOHONEN

SUBJECT : Contract n° 7.81/01 - UNIDO PROJECT n° DP/ELS/78/001

Dear Doctor :

In order to explain why delays took place in achieving this programme, it appears necessary to us to supply hereunder some details on the circunstances under which the experiment took place.

POLITICAL AND ECONOMICAL CONDITIONS

Without trying to dramatize things, it seems we have found on the site the worst conditions one could imagine to carry out a feeding programme based on agrobiology.

The insecurity in the country and the economical situation have compelled us, from the first day on, to modify the programme initially decided and afterwards to adapt ourselves to the situation, practically daily.

Among these difficulties, let us mention more particularly :

1) Lack of preparation on the spot and underestimate of local problems

The U.N.I.D.O. people locally in charge of the project have many other tasks to fulfill ; they have done their best to help us, but, we have never, at any moment, been able to receive the help of technicians, as provided for in the contract (UNIDO Facilities and Services 3.01.).

.../...

We have hired and trained our own technician, Mr. Carlos LERET, graduated from E.N.A. of EL SALVADOR and from TEXAS A and M. He worked for us, at our expense, from June 1981 to December 1981, either at full time or on demand.

The Minister of Agriculture and other dignitaries have changed twice during the time of the experiment.

2) Products

The PROTEINOR product took two and halfmonths to be delivered from FRANCE, as it remainedone month blocked up in GUATEMALA. This delay has decreased its efficiency.

3) Materials

The agricultural materials and by-products initially selected for the experiment often disappeared at the time they were needed, because the had been sold or assigned to other uses : coffee pulp, bagasse. We were therefore compelled to search urgently fo new by-products, while modifying our plans.

4) Transport

The transport of these materials, particularly bagasse, has forced everyone to work wonders to find available trucks and pay the carriers.

5) Control

Once the silos had been erected, the analysises when erecting and opening done, the animals chosen and the food rations calculated, there still remained to follow the feeding programme instructions. Infortunately, everywhere, for multiple reasons, among which the lack of food for the animals, the lack of financial and technical means, etc... The instructions confirmed orally and in writing were not respected ; lots have been mixed up, rations have been more or less changed and weight and milk production controls have not been made.

CONCLUSION

One must have experienced it on the site, to understand this type of situation and realize the wonders of patience, ingenuity and energy which must be displayed in order to try, despite all this, to carry out the contract.
And it is certainly not the lure of profit which pushed us.

To conclude, I should like to point out that this venture could only be brought to end through the initiative of someone of exceptional kindness and devotion, namely doctor Konrad SCHULTZ, who rightly believed that this programme could bring a partial solution to the food problems of SALVADOR.

Therefore, whatever have been the technical and material difficulties which we encountered, and although obtained data are, scientifically speaking, incomplete, we are glad to have been able to contribute to this programme.

.../...

*We rely on yourhelp to ensure that commitments taken on one side and the other are respected and we hope to have the opportunity to meet you again on the occasion of a new programme which we hope will this time, develop in good conditions.*

*Yours sincerely*

*Y. de DIESBACH*

*Notes*

*In order to answer in a precise way to the reproaches which have been made to the TACHON firm, we shall add this :*

*1) The report on the sixth month was to include the programme of the termination of the experimental works : we agree, but it had been provided for, since the start, that the experiment would consist of four periods*

*1° period : preparation*

*a) inspection of the sites (4)*
*b) selection of refuses*
*c) selection of animals (age, sex, destination : milk, meat.*

*2° period : building up of silos and analysis of samples before siloing*

*3° period :*

*a) opening of silos*
*b) analysis of samples after 45 days of ensilage*
*c) feeding programme*
*d) daily checking of weight increases and milk production*

*4° period : analysis of collected results and conclusions*

*2) Visits on site provided for in contract 7 and 2 months stay on site of one technician*

*There has been 6 visits on site during which Mr. Y. de DIESBACH has stayed 25 days. But Mr. Carlos LERET has been hired and paid from June 1981 to December 1981, i. e. more than 5 months.*

*3) Which PROTEINOR products has been used ?*

*There are now on the market 3 PROTEINOR products :*

*. Bioensilage*
*. Biostarter*
*. Biogrowth*

*The product used in EL SALVADOR is "Bioensilage" which is the most popular in FRANCE.*

-=-=-=-=-=-=-=-=-=-=-=-

## *4 th PERIOD*

## *ANALYSIS OF RESULTS*

*As we already explained, we have no complete results, only partial ones for the last period.*

*We shall try however, with the help of the information at hand, to draw some conclusions on these twelve months of experiment from april 1981 to april 1982.*

*The procedure we have used is a follows :*

*1) Calculation of erection cost of silos with and without PROTEINOR ;*

*2) Increase of weight or milk production of completed lots, and of the other ones, with and without PROTEINOR ;*

*3) Comparison of results in order to determine whether gains in weight or milk production would financially justify the use of plant wastes in combination with PROTEINOR.*

.../...

## A - COST OF SILOS

The only information in figures we have been able to secure come from the "PASA TIEMPO" cooperative farm.

The cost of silos have been as follows :

SILO N° 1 from April 9 to April 15 1981

151.6 T

| | | |
|---|---|---|
| . Labor | ¢ | 979.00 |
| . Fuel (116 gallons x ¢ 4.13) | | 480.00 |
| . Urea 45.48 x 2 % = .9096 x ¢ 750/t. | | 682.20 |
| . Salt 45.48 x 1 % = .4548 x ¢ 500/t. | | 227.40 |
| . PROTEINOR 45.48 x 2 % = 909.6 x ¢ 5 (salt at 70 % humidity) | | 4,548.00 |
| . Molasses 45.48 x 5 % = 2 274 x ¢ 6/t. | | 113.70 |
| . Bagasse = (1/3) 50.53 x ¢ 6/t. | | 303.20 |
| . Coffee pulp = (2/3) 100 x ¢ 5/t. | | 500.00 |
| | ¢ | 7,833.50 |

Cost per ton : ¢ 7,833.50 : 151.6 = ¢ 51.67

Cost of PROTEINOR product is : 4,548.00 (U.S. DOLLAR 1 = 2.50 SALVADOR COLONES)

SILO N° 2 (April 22 to April 1982 : Corn - Bagasse : 115 T.)

| | | |
|---|---|---|
| . Labor | ¢ | 658.40 |
| . Fuel | | 222.48 |
| . Corn zacate 2/3 | | 543.00 |
| . Bagasse 1/3 38.33 x ¢ 6 | | 229.98 |
| . Urea | | 753.75 |
| . Salt | | 193.88 |
| . PROTEINOR 115 t. x 30 % x 2 % = 0.690 x ¢ 5,000 | | 3,450.00 |
| . Molasses | | 115.55 |
| | ¢ | 6,167.04 |

Cost per ton :¢ 6,167.04 : 115 = ¢ 53.63

Cost of PROTEINOR : 3,450.00

.../...

*SILO N° 5 (June 26 to July 17 - Corn zacate = 110 T.)*

| | | |
|---|---|---|
| . Labor | ¢ | 645.40 |
| . Fuel | | 211.41 |
| . Corn waste | | 805.00 |
| . Urea | | 749.60 |
| . Salt | | 188.71 |
| . PROTEINOR 110 x 30 % x 2 % = 0.660 x ¢ 5,000 | | 3,300.00 |
| . Molasses | | 109.12 |
| | ¢ | 6,009.24 |

Cost per ton : ¢ 6,009.24 : 110 T. = ¢ 54.62

Cost of PROTEINOR : ¢ 3,300.00

*SILO N° 6 (June 23 to July 2 - Pandola grass = 190 T.)*

| | | |
|---|---|---|
| . Labor | ¢ | 1,144.75 |
| . Fuel | | 1,354.24 |
| . Pangola grass (190 x ¢ 13.33 | | 2,532.70 |
| . Urea (1.13 x ¢ 7.50/t.) | | 847.50 |
| . Salt (.50 x ¢ 500/t.) | | 250.00 |
| . PROTEINOR (57 t. x 2 % = 1.14 x ¢ 5,000 | | 5,700.00 |
| . Molasses (3.22 x ¢ 50/t.) | | 161.00 |
| | ¢ | 11,990.19 |

Cost per ton : 11,990.19 : 190 T. = 63.10

Cost of PROTEINOR : ¢ 5,700

.../...

## *B - MEAT AND MILK PRODUCTION GAIN*

*For multiple reasons and particularly due to the lack of food, we could not obtain that selected lots of animals remain separated and that feeding of lots selected fo experimentation and that of reference lots be done separetely.*

*Consequently, all the animals on the three sites have been fed together and indifferently with ensilages which were available at the moment, whether they would contain PROTEINOR or not.*

*Likewise, it has been impossible, either through lack of available manpower, or through lack of scales or other technical equipment, to weigh daily the animals and to record daily the milk production.*

*At this stage of experimentation, we have no precise information which could allow us to support any scientific demonstration.*

*The only information which is reliable, apart from silo n° 1 of PASA TIEMPO the pulp of which has caused alimentary troubles. (pulp already fermented when it was used : analysises showed presence of aflatoxine and copper oxide), and silo n° 7 of IZALCO breeding Center which was miscarried at 60 %, is that all users are unanimous in saying that they have never had so healthy animals and particularly at PASA TIEMPO that animals poisoned by silo n°1 had cured in an astonishing way (see letter).*

# *C O N C L U S I O N*

*The general feeling which comes out of this experiment is that, unfortunately, it took place in the worst possible political and economical conditions, which prevented from drawing all desirable information.*

*Nevertheless, it demonstrated that it is possible to feed animals with plant wastes, particularly such as coffee pulp and bagasse (banana trunks and sugar cane heads could not be found in sufficient quantity at the time the silos were built up).*

*Facing the present shortage of meat and the necessity for EL SALVADOR to restore its stock-farming, it would be desirable, and this is the wish of the people responsible for the plan, of the Banca de FORMENTOR and of the sites managers, to carry on the experiment in making certain, this time, that the necessary conditions of rigorous scientifical controls are gathered.*

*We wish to thank all those who were kind enough to help us achieving this programme :*

- *His excellency the Minister of Agriculture,*
- *His excellency the Minister of the Plan together with Doctors QUINONES and MAJANO,*
- *The manager of the Bank of FORMENTOR,*
- *The manager of the CENTA laboratory together with Doctors SEGURA and MARTINEZ,*
- *The manager of the National College of Agriculture,*
- *The manager of the IZALCO breeding center,*
- *The President of the Cooperative Farm of PASA TIEMPO and Mr. MORENO,*
- *Mr. PAINTER, manager of U.N.I.D.O. and Miss BOWERS, not to forget the regretted Dr. SCHULTZ whose devotion, patience and energy allowed this programme to come to life and to be brought to an end.*

-=-=-=-=-=-=-=-=-=-=-