# HALF YEARLY PROGRESS REPORT

a) Report for the 1st half of 1990

b) Grantee: Dr. K.K.Pathirana

c) Address: Dept. of Animal Science, Faculty of Agriculture, University of Ruhuna, Kamburupitiya.

d) Grant No.: SAREC/9/BF/39

e) Title of Project: Production Systems of Ruhunu Curd

f) Date of award of the Grant by NARESA: By letter dated 17-11-1989.

g) Description of the Work Done During the Half Year

1. Background information
   The study basically involves a survey and collection of samples of curd for bacteriological studies for chacacterization of cullture used in the curdling of milk. Appointment of a co-grantee, two co-workers and co-ordination of their work, together with the purchase of a motor cycle for field work in May 1990 have been done.

2. Field studies (Survey)
   - a questionnaire was prepared
   - it was pre-tested with 15 farmers from different locations in Hambantota district
   - the questionnaire was revised for the pilot study
   - steps have been taken for computerization of data

3. Laboratory studies (Bacteriological work)
   Nil

4. Data collected, results and discussion
   Out of the preliminary and limited information collected using a questionnaire and other inquiries, indicated below are some interesting findings.
   - although outside Hambantota district, Thanamalwila seems to contribute substantially to the production of Ruhunu curd
   - curd is produced by milk producers as well as by non-milk producers with purchased milk
   - large scale curd producers seem to be more frequent among the latter category
   - environment conditions seem to play an important role in the curdling of milk which the producers emperically make use of. Thus 1) most of them said that curdling is poor on rainy days, even if it is the odd day during the drought and 2)the time set for curdling is during the warmest period of the day from about 10 a.m. to 3 p.m.
   - there does not seem to be much interaction between curd producers regarding curd making methods, indicating potentential for third party intervention to collect the most appropriate methods and disseminate it as a package deal among

curd producers.
- curd made of buffaloe milk alone whould consist of white fat while yellowish colour indicates milk from neat cattle to varying degrees
- desire among small scale curd producers to expand it to more economically viable units, but the lack of capital a major constraint.

h) Is the work done on schedule? No. About 3 months behind schedule. It is hoped to overcome the delay by modification of the work plan to some extent.

i) Plan of work for the next half year

3-4 months: obtain a list of names and addresses of all operators* and all holdings** with the help of GSS (by GS divisions)

2-4 weks: add further to the lists, if there are any, with the help of range Veterinary Surgeons and their LDT/LDI and by visiting the listed holdings to obtain further producers of curd, if any.

N.B. Operator is a person who either makes or sells curd or one who gives instructions for curd making from day to day. He is the person from whom the information will be obtained. He need not necessarilly be the owner.

Holding comprises of all units (land, herds, curd, etc.) of one operator.

1-2 weeks: determination of sample distrilbution and size. This will be done by GS divisions in each AGA division. It is expected to sample approximately 5% of the total holdings.

2-4 weeks: testing of the 2nd questionnaire(pilot survey) using 2 holdings/AGA division (9 AGA div. x 2 = 18 holdings)

2-3 weeks: formulation of the final questionnaire.

Total period to be taken 5 to 7 months.

Culture studies:
During above period following have to be done
1. ordering of culture media
2. training of a technician in culturing techniques
3. preliminary testing of cultures

j) Any other remarks: due to a change in the co-grantee for studiers on cultures, it is difficult to predict at this time the expected delay in the studies on cultures and keeping quality of curd.

k) Signature of the grantee:

l) Comments (if any) of Head of Dept.: Nil

m) Signature of Head of Dept.: Date: 30-08-90

# HALF YEARLY PROGRESS REPORT

a) Report for the 1st half of 1991.

b) Grantee: K.K.Pathirana.

c) Address: Dept. of Animal Science, Faculty of Agriculture, University of Ruhuna, Kamburupitiya.

d) Grant No. SAREC/9/BF/39.

e) Title of the Project: Production Systems of Ruhunu Curd.

f) Date of Award of Grant: By letter dated 17 Nov. 1989.

g) Description of the Work Done During the Half Year:

Field studies

Ref. plan of work for this half year as given in the last progress report, action was taken to obtain information from the remaining Grama Niladari Divisions (GND). Out of the total of 610 GND, information from 494 GND have been obtained, accounting for 81% of the total, compared with 403 or 66% at the end of last 6 months. Information on the producers of curd is being still received.

Laboratory studies

Microbiological work has not commenced as yet, since chemicals, biochemicals and glassware for this purpose are yet to be obntained. Quotations and the need for additional funds for this purpose have been forwarded to NARESA.

Data collected (Field studies)

Data on Producers of Curd within AGA Div. & by Entire Area: There were 1726 curd producers in the 81% of the total area covered so far. Highest no, of producers were in Ambalantota AGA Div, and the lowest in Okawela as before. i.e. at the end of last half year.

Data on the Pots of Curd Produced/Day within AGA Div. and Entire Area: There were 18,911 pots of curd produced/day in the 81% of the total area covered so far. Highest no. of pots were produced in Tiss AGA Div. while the lowest in Okawela as before.

Data on the Cattle Owned by Producers of Curd within AGA Div. and by Entire Area: There were a total of 31,131 cattle owned by the producers of curd in 81% of the total area covered. Tissa AGA Div. remained the one with the highest no. of neat cattle and buffaloes.

Data by Curd Producers: Tissa AGA Div. also remained the one with the highest no. of pots of curd produced, highest no. of neat cattle and buffaloes owned by a single curd producer.

h) Is the work on schedule? If not what steps would be taken to avoid further delay.

Work is not on schedule. It is taking more than the anticipated time to obtain the information from the rest of the GND. If not 100%, atleast 90% i.e. approx. 550 out of 610 GND are to be covered in the survey.

Microbiological work with samples of curd is delayed until the chemicals, biochemicals and glassware for that purpose is supplied. Quotations for the supply of these items have been submitted to NARESA.

Delay in the computerisation and handling of the large amount of data from the questionnaire will be much facilitated and the delay in this aspect avoided if a computer setup as requested through the new proposal for extension of this project is granted.

i) Plan of work for the next half year.

Complete obtaining of information on the producers of curd(atleat to cover 90% or 550 of the total of 610 GND) of Hambantota district and Tanamalwila AGA division in Moneragala district.

Complete the pilot survey

Finalise the questionnaire and the sample for the final survey. Commencement of the final survey. Samples of curd to be obtained for microbiological work, after obtaining the chemicals, biochemicals and glassware requested for that purpose.

j) Any other remarks: Attention is drawn again:1) for the need for additional funds for the purchase of chemicals, biochemicals and glassware as per quotations submitted to NARESA, and 2) on the need for a computer setup to facilitate handling and processing of the large amount of data as expected from over 2000 curd producers. Funds for a computer setup (Rs. 250,000.00) have been included in the new project proposal for an extension of this project. That will allow more time, funds and facilities to do a more comprehensive and a better job of work.

Signature of the Grantee:

Comments (if any) of Head of Dept./Section: I strongly recommend to obtain a Computer set up to analyze large number of data gathered through the Project.

Signature of Head of Department/Section: 14-6-91

D. ROHAN RAJAPAKSE
DEAN, FACULTY OF AGRICULTURE
UNIVERSITY OF RUHUNA
MAPALANA, KAMBURUPITIYA
SRI LANKA.

c.c. Dr. S.S.E. Ranaweera.

# HALF YEARLY PROGRESS REPORT

a) Period : Second Half of 1991

b) Grantee : K.K.Pathirana

c) Address : Dept. of Animal Science, Faculty of Agriculture
University of Ruhuna, Kamburupitiya.

d) Grant No: SAREC/9/BF/39

e) Title of the Project : Production Systems of Ruhunu Curd.

f) Date of Award of Grant : By letter dated 17 Nov. 1989.

g) Description of the Work Done During the Half Year.

## Field Studies

Out of 609 (610 earlier) Grama Niladari Divisions (GND) of Hambantot District (576) and Tanamalwila AGA Division (33) from Moneragal District, preliminary information on the producers of curd have bee obtained from 511 GND (83.8% of the total). The GND responding t reminders mainly report that there aren't any curd producers in thos divisions. Therefore it can be reasonably assumed that th contribution to Ruhunu Curd Production by those GND is of mino significance. However, these GND will also to be covered while othe aspects of the study will be now given priority.

## Laboratory Studies

Due to delays in obtaining chemicals, biochemicals and glassware fo microbiological studies, this work has not commenced.

h) Is the work on schedule ? Steps to be taken to avoid further delay.

1. Processing of the large no. of data from 1974 curd producers was delayed due to lack of computer facilities. Since the computer requested through the proposal for the next phase has not been allowed, action has been taken to obtain a computer from another grant which can then be used for this work as well.

2. Due to delay is obtaining biochemicals, chemicals and glassware required for microbiological work, those aspects are yet to commence. Financial inadequancy which was completely beyond my control as informed to SAREC Research Committee, was mainly responsible for this delay. Dr. Chandra Kodikara (Co-grantee) resuming work at the Faculty of Vet. Medicine & Animal Science has already taken action to expedite matters.

i) Plan of work for the next half year.

Select the sample of farmers for microbiological studies (5% of the total) and obtain samples of curd for that work. Obtain further information on production systems of Ruhunu curd.

j) Any other remarks:

Signature of the Grantee:

Comments (if any) of Head of Department/Section: —

Signature of Head of Department/Section.

HEAD (ANIMAL SCIENCE)
UNIVERSITY OF RUHUNA

# HALF YEARLY PROGRESS REPORT

a) Period : First half 1992

b) Grantee : K.K.Pathirana

c) Address : Dept. of Anim. Sci., FAc. of Agric.. Univ. of Ruhuna. Kamburupitiya.

d) Grant No: SAREC/9/BF/39

e) Title of the Project: Production Systems of Ruhunu Curd.

f) Date of Award of Grant: By letter dated 17 Nov. 1989

g) Description of the Work Done During the Half Year

## Field Studies

Final questionnare was drawn-up based on the information gathered through the pilot survey (data reported in earlier reports). Information is now being obtained using the final questionnare. Due to the non-availability of the requested computer through the SAREC project, processing of the large amount of data was delayed. With a computer obtained through another project, the information will be computerized and the data will be reported during the 2nd half of 1992.

## Laboratory Studies

Preliminary isolation of cultures indicate a predominance of Lactobacilli, Yeasts and E. coli (contaminants). Cultures have been sent to Dr. Chandra Kodikara for specific typing and further investigation.

This work has just commenced and is being continued with limited amount of chemicals and glassware found from sources other than the SAREC project (Drs. Chandra Kodikara and Sita Hettige pooled whatever resources they had).

h) Is the work on schedule ? Steps to be taken to avoid further delay

1. Processing of data delayed due to lack of a computer to handle the data of approx. 2000 curd makers. Since the request for a computer from SAREC has been turned down, the work is now being done using a newly acquired computer system through other sources.

2. The need for chemicals and glassware for the microbiological work has been highlighted through previous progress reports and letters. Eventually, the quotations submitted by NARESA have been recommended by Dr. Chandra Kodikara for purchase. We are yet awaiting these supplies. Microbiological work of the project has been initiated with a limited amount of chemicals provided by Dr. Kodikara.

3. Funds for Travel.
   Originally requested a total of Rs. 70,000/- for 2 years. We were asked to reduce it to Rs. 50,000/- with Rs. 30.000/- for the 1st year and Rs. 20,000/- for the 2nd year. The scope of the survey was increased by doing a total rather than a sample survey. Further, Thanamalwila AGA division has been included in the survey, in addition to all AGA divisons of Hambantota district. Therefore, the expenditure for travel has increased. As such we need atleast another Rs. 10,000/- for travelling in order to complete the survey and to obtain samples of curd, the isolated cultures of which have to be transported to Peradeniya for specific indentification. A letter requesting Rs. 10,000/- for travelling is sent herewith.

Contract No. : SAREC/09/BF-39

Title : Production Systems of Ruhuna Curd

Institute : University of Ruhuna

Chief Scientific Investigator : K.K. Pathirana

Time Period Covered : July to Dec. 1992

## Description of Research Carried Out and Results Obtained

### Field Studies (Survey)

Ref. progress report for the 1st half 1992, it was stated that due to the non-availability of a computer requested through the SAREC project, processing of the large amount of survey data involving realy 2000 farmers was delayed. As mentioned in it, computer facilities obtained through funds from other sources have been used to process SAREC project data and the results were given to be presented at the last Review Seminar. See annexed tables 1 to 3.

Table 4: Information obtained from curd producers using a comprehensive questionnaire (only the information processed so far)

| | Neat Cattle | Buffaloes |
|---|---|---|
| Herd Strength ($\bar{x}$/herd) | 17.2 | 23.4 |
| Age at 1st calving (yr.) | 3.5 | 3.6 |
| Calving interval (yr.) | 13.6 | 15.1 |
| Cows (dry or in milk) used for draft | Nil | Nil |

Artificial Insemination: Yes 26%, No 74%. Why not ?: No facilities 40%, technique unsucessful 30.0% and unaware 30.0%

Calf mortality was highest during 2-6 mo. age. Precentage of tot. calf mortality during that age: Neat cattle 62.5%, buffaloes 52.0%.

Vaccination of animals : Yes 13.0%, No 87.0%

Utilization of total liquid milk produced : Curd making 77.5%, sold as such 15.0% and home consumption 7.5%.

Table 1: Extent of the Area Covered

| District | Asst. Govt. Agent Div. | Grama Niladari Division | | |
|---|---|---|---|---|
| | | Tot.No. | No.Covered | % |
| Hambantota | 1. Tissa | 44 (7.2) | 38 (7.4) | 86.3 |
| | 2. Lunugamwehera | 36 (6.0) | 29 (5.7) | 80.6 |
| | 3. Hambantota | 29 (4.8) | 25 (4.9) | 86.2 |
| | 4. Suriyawewa | 19 (3.1) | 15 (3.0) | 78.9 |
| | 5. Ambalantota | 58 (9.5) | 54 (10.6) | 93.1 |
| | 6. Angunakola | 51 (8.4) | 38 (7.4) | 74.5 |
| | 7. Tangalle | 72 (11.8) | 68 (13.3) | 94.4 |
| | 8. Beliatta | 71 (11.6) | 60 (11.7) | 84.5 |
| | 9. Weeraketiya | 85 (14.0) | 67 (13.1) | 78.8 |
| | 10. Okewela | 27 (4.4) | 27 (5.3) | 100.0 |
| | 11. Katuwana | 84 (13.8) | 69 (13.5) | 82.1 |
| District Tot. | | 576 | 490 | 85.1 |
| District $\bar{X}$ | | 52.4 | 44.5 | |
| SD | | 23.3 | 19.8 | |
| Monaragala | 12. Thanamalwila | 33 | 22 | 67 |
| | | (5.4) | (4.3) | |
| Survey Tot. | | 609 | 512 | 84.0 |
| Survey $\bar{X}$ | | 50.7 | 42.6 | |
| SD | | 24.4 | 20.8 | |

| AGA Division | Producers of Curd | | | | | | | Pots Produced | |
|---|---|---|---|---|---|---|---|---|---|
| | With own Milk | | With Bought Milk | | Own & Bought Milk | | Total | Farmer/ | Total/ |
| | No. | Percent | No. | Percent, | No. | Percent | No. | day | day |
| **Hambantota District** | | | | | | | | | |
| 1. Tissa | 75 | 62.0 (3.8) | 43 | 35.5 (2.2) | 3 | 2.5 (0.1) | 121 | 29 | 3518 (18.7) |
| 2. Lunuganwehera | 44 | 63.8 (2.2) | 24 | 34.8 (1.2) | 1 | 1.4 (0.05) | 69 | 33.8 | 2334 (12.4) |
| 3. Hambantota | 181 | 83.8 (9.2) | 25 | 11.6 (1.3) | 10 | 4.6 (0.5) | 216 | 8.6 | 1861 (9.9) |
| 4. Suriyawewa | 86 | 96.6 (4.3) | 3 | 3.4 (0.1) | 0 | 0 (0) | 89 | 9.0 | 807 (4.3) |
| 5. Ambalantota | 362 | 96.8 (18.3) | 7 | 1.9 (0.3) | 5 | 1.3 (0.2) | 374 | 7.0 | 2652 (14.1) |
| 6. Angunakola | 190 | 97.4 (9.6) | 5 | 2.6 (0.2) | 0 | 0 (0) | 195 | 5.8 | 1139 (6.0) |
| 7. Tangalle | 243 | 98.0 (12.3) | 1 | 0.4 (0.05) | 4 | 1.6 (0.2) | 248 | 6.2 | 1557 (8.2) |
| 8. Beleatta | 158 | 99.4 (8.0) | 1 | 0.6 (0.05) | 0 | 0 (0) | 159 | 4.4 | 704 (3.7) |
| 9. Weeraketiya | 215 | 99.5 (10.9) | 0 | 0 (0) | 1 | 0.5 (0.05) | 216 | 4.3 | 939 (5.0) |
| 10. Okewela | 51 | 100 (2.6) | 0 | 0 (0) | 0 | 0 (0) | 51 | 2.3 | 121 (0.6) |
| 11. Katuwana | 129 | 98.5 (6.5) | 2 | 1.5 (0.1) | 0 | 0 (0) | 131 | 6.0 | 796 (4.2) |
| District Tot. | 1734 | | 111 | | 24 | | 1869 | - | 16428 |
| $\bar{X}$/AGA Div | 157.6 | | 10.1 | | 2.2 | | 169.9 | 10.8 | 1493.4 |
| SD | 95.4 | | 14.2 | | 3.1 | | 93.5 | 10.5 | 1009.8 |
| **Monaragala District** | | | | | | | | | |
| 2. Thanamalwila | 95 | 90.5 (4.8) | 8 | 7.6 (0.4) | 2 | 1.9 (0.1) | 105 | 23 | 2422 (12.8) |
| Survey Tot. | 1829 | | 119 | | 26 | | 1974 | - | 18850 |
| $\bar{X}$ AGA Div | 152.4 | 92.7 | 9.9 | 6.0 | 2.1 | 1.9 | 164.5 | 12 | 1571 |
| SD | 92.7 | 13.4 | 13.5 | 13.30 | 3.0 | 1.24 | 91.1 | 11 | 999 |

Table 3: Cattle owned by the Producers

| AGA Division | Neat Cattle | | Buffaloes | | Total Cattle |
|---|---|---|---|---|---|
| | No. | Percent | No. | Percent | |
| **Hambantota District** | | | | | |
| 1. Tissa | 2149 | 40.9 | 3103 | 59.1 | 5252 |
| | | (12.1)[1] | | (16.0) | (14.2) |
| 2. Tunugamwehera | 2078 | 56.0 | 1608 | 43.6 | 3686 |
| | | (11.7) | | (8.3) | (9.9) |
| 3. Hambantota | 1990 | 56.9 | 1508 | 43.1 | 3498 |
| | | (11.2) | | (7.8) | (9.4) |
| 4. Suriyawewa | 463 | 52.5 | 418 | 47.4 | 881 |
| | | (2.6) | | (2.1) | (2.4) |
| 5. Ambalantota | 2747 | 40.4 | 4110 | 60.5 | 6792 |
| | | (15.4) | | (21.2) | 18.3) |
| 6. Angunakola | 967 | 38.4 | 1552 | 61.7 | 2519 |
| | | (5.4) | | (8.0) | (6.8) |
| 7. Tangalle | 2167 | 55.2 | 1757 | 44.8 | 3924 |
| | | (12.2) | | (9.1) | 10.6) |
| 8. Beliatta | 1252 | 66.7 | 624 | 33.3 | 1876 |
| | | (7.0) | | (3.2) | (5.0) |
| 9. Weeraketiya | 1457 | 59.6 | 988 | 19.9 | 2445 |
| | | (8.2) | | (5.1) | (6.6) |
| 10. Okewela | 373 | 83.6 | 73 | 16.4 | 446 |
| | | (2.1) | | (0.4) | (1.2) |
| 11. Katuwana | 742 | 70.3 | 313 | 29.7 | 1055 |
| | | (4.2) | | (1.6) | (2.8) |
| District Tot. | 16385 | | 16054 | | 31374 |
| X | 1489.5 | | 1459.4 | | 2943.1 |
| SD | 791.3 | | 1228.4 | | 1938.7 |
| **Monaragala District** | | | | | |
| 12. Thanamalwila | 1390 | 29.6 | 3318 | 70.5 | 4708 |
| | | (7.8) | | (18.7) | (12.7) |
| Survey Tot. | 17875 | 47.8 | 19372 | 52.1 | 37082 |
| | 1472.9 | 50.6 | 1614.3 | 44.1 | 3090.1 |
| SD | 756.6 | 18.92 | 1288.2 | 17.0 | 1917.4 |

(Survey Pvt. & Total Survey)

Regularity of curd making : Daily 95.7%, Every other day 2.3%.

Those adding anything else to buffalo milk in curd making : Water 2.8%, neat cattle milk 1.4%, the balance-nothing added ?

Removal of fat before curd making : 8.7%

Data on above information will change with more data from continuing survey while info. on several other questions yet to be processed.

Laboratory Studies

In addition to many other problems, the inability to obtain additional funds for biochemicals and glassware for microbiological work seriously affected the progress of this work.

Ref. progress report for ~~the~~ 1st half of 1992, this work has been commenced with limited funds from other sources and the results are summarised in Table 5. Grant no. SAREC/09/Bf-83 as a continuation of this project is mainly meant to complete this aspect.

Table 5: The mean and range lactic acid fermenting organisms, Coliforms, E. Coli, Yeast and Moulds per gram of curd - (only 13 sample have been tested

| | Lactobacillus | Streptococcus | Coliforms | E Coli | Yeast Moulds |
|---|---|---|---|---|---|
| Mean Count/gram | $55 \times 10^7$ | 300 | $4 \times 10^4$ | N.G.[1] | $23 \times 10^4$ |
| Range/gram | $70 \times 10^6$ $60 \times 10^8$ | N.G.-300 | only one sample was positive | | N.G. to $84 \times 10^4$ |

[1]N.G. - No Growth

## Discussion of Results and Conclusions drawn

Out of a total of 1829 curd producers large majority (92.7%) produce curd solely with milk from their own cattle while those producing curd only from bought milk and those using both sources of milk were 6.0% and 1.3%, respectively. AGA divisionwise Okewela had the highest (100%) while Tissa the lowest (62.0%) in the 1st category. Highest and the lowest no. of curd producers were in Ambalantota (374) and Okewela (51), respectively while the highest and the lowest no. of pots/day were produced in Tissa (3518) and Okewela, respectively. Total no. of curd pots produced/day in Hambantota district was 16428. Highest and the lowest avg. no. of pots/farmer/day were in Lunugamwehera (33.8) and again in Okewela (2.3), respectively.

Out of a total cattle (neat and buffalo) population (37082) owned only by the producers of curd; there were more buffaloes than neat cattle in Thanamalwila (70.5%), Angunakolapelessa (61.7%), Ambalantota (60.5%) and Tissa (59.1%) while other 8 AGA divisions had more neat cattle than buffaloes with Katuwana having the highest (70.3%). Ownership of neat cattle vs buffaloes by the curd producers who produce curd largely out of their own milk (92.7%) would help determine the amount of curd made of buffalo milk in different AGA divisions.

Average buffalo herds are larger than that of neat cattle and buffaloes take a longer time to calve. So far, there were no farmers using cows for draft at any physiological stage. Dissatisfaction with A.I. (40%) and unawareness of it (30%) leaves sufficient room for improvement of A.I. services. Highest calf mortality during 2-6 mo. of age indicate helminth parasites as a major cau[illegible] while nutritional causes seem to be much less likely due to calves being suckled for a much longer period than that (unprocessed data). Inspite of a low percentage of vaccinations (13.0%) the low cattle mortality as it appears (unprocessed data) indicate a rare incidence of fatal cattle diseases otherwise of an endemic nature.

## Presentation of Results

Results were presented at the progress review seminar held at the V.R.I. on

6 Oct. 92.

Any Significant Departure

The scope and intensity of the survey has been increased as mentioned in previous reports.

Prof. K.K.Pathirana

BR-39

ANNEX I

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## 9. Objectived and Significance of Research Project *

Per capita consumption of animal protein (including fish)in Sri Lanka has been 0.92 g./day according to the latesrt figures(Dept. of Census and Statistics, 1987). It is far below the nutritional requirements. Inspite of imports, the per capita intake of proteins from milk and milk products was only 2.14 g/day. Therefore there is a great needto promote consumption of milk and Milk products.

Curd is a product which is more or less unique to Sri Lanka. That made from buffalo milk always had a greater demand. Buffalo curd made in Southern Sri Lanka, typically known as "Ruhunu Curd" has been long recognized and appreciated for its special quality. Most of the typical Ruhunu Curd in fact comes from Hambantota district. With no known external technical inputs, the production of Ruhunu Curd has stabilized as an important cottage industry of the community.

Due to following reasons it is now appropriate to conduct a systematic study on the production systems of Ruhunu Curd.

1) it is a socio-economically accepted cottage industry catering to th well being of the small farmer on one hand and to the consumer on the other,
2) collection, storage and transport facibities for milk in Southern Sri Lanka is about the worst in the country, Conversion to curd helps shelf life at ambient temperatures as well as transport,
3) production of curd overcomes problems due to lactose intolerance, which is common in the population,
4) it seems that buffalo milk from which typical Ruhunu Curd is made, can be in fact more appropriately used, socio economically for that purpose than any other purpose,
5) compared to many other districts, Hambantota district has hardly any major industry; livestock or otherwise. while Hambantota together with Mannar being driest of the dry zone, and
6) no studies whatsoever have been conducted so far on the production of curd in Southern Sri Lanka.

A proper understanding of the production systems would help carefully planned technical intervention in the future to improve the quality and hygienic standards of the product while assisting the producers to earn maximum benefits through the production of curd.

### Specific Objectives of the Experimentation in the years 1989/90 and How they fit the long term objectives

Main objective being to obtain base line information on the following aspects.

a) nature of ownership and socio-economic aspects of farmers associated with the production of curd
b) herd composition, management systems, feeding and utilization of buffaloes for other purposes
c) materials (cultures, pots, other utensils, etc. ) and methods used in the production of curd
d) keeping quality, nutritive value and hygienic standards of the curd and cultures used.

The information gathered will help decide the areas and manner in which to facilitate the production of better curd socio-economically.

I2. Project description

The study intended to cover the Southern Province which consists of 3 districts in the following order of importance with regard to the production of Ruhunu curd: Hambantota (mainly Ambalantota and Tissamaharama), Matara and Galle districts.

I. An idea of the total no, of farmers having buffalo herds for the districts will be obtained from the Census and Statistics Department in which details of Highland Crops and Livestock Survey, I980 and the Sri Lanka Census of Agriculture, I982 - small holding sector are available. Also the personnel involved at district levels who are still available (A.G.A. , Cultivation officer, etc. ) and the methology of those personnel will be requested at the initial stages to work in collaboration with those from the veterinary ranges. The R.A. will be personally responsible for the collection of data( 2 months duration)

2. Training in data tabulation & analysis using computer for R.A. ( 2 months)

3. Based on the above information, all the farmers having buffaloes will be visited to quickly find out the house holds involved in the production of buffalo curd since this information is so far not documented. (4 months).

4. Before the conduct of the actual survey, a questionnaire will be finalized through 2 stages.

Ist. stage: a questionnaire prepared will be tested with few farmers (I5-20), and will be modified to suit the objectives & facilitate gathering of information (2 months).

2nd stage: the modified questionnaire will be tested in a pilot study with about 50 farmers, following which the final questionnaire will be prepared. During these stages, samples of curd, etc. can be sent to the Faculty of Vet. Medicine & Anim. Husbandry for initial testing. (2 Months)

5. The final survey will then be carried out to cover atleast 5% of herds (small, medium and large) as well as the households involved in the production of curd in the respective areas by AGA divisions covered by Veterinary ranges. For the study of cultures, quality and testing for hygienic standards of curd making, samples from a lower coverage of at least I% of house holds involved in curd making will be covered. enumeration of indicators of fecal contamination (Coliforms & E.Coli). Hygienic quality will be checked by keeping quality of curd will be estimated, by checking organoleptic properties, acidity and pH of the curd samples, daily from the day of production. Cultures used in making Ruhunu Curd will be studied by isolating the different organisms found in samples of curd, using selective media. The isolates will be indentified by biochemical reactions. (3 months - 5, I½, and I½ months, respectively for Hambantota, Matara & Galle districts, respectively).

6. Data tabulation and analysis (4 months)

7. Report writing.

Notes:

a) Information obtained through the questionnaire during the final survey will be transformed into a summary form containing essential information for review on a monthly basis.

b) During the survey proper, samples of curd, forages consumed, blood, etc. will be obtained for despatch to respective laboratories.

c) Data will be analysed by AGA division, district and agroecological zone. Correlations of relevant variables will be done.

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