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सांख्यिकीय सूचना-पत्र

I. A. S. R. I.
STATISTICAL NEWSLETTER

Volume-IX | January-March, 1983 | Number-1

भारतीय कृषि सांख्यिकीय अनुसंधान संस्थान
(भा० कृ० अ० प०)
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प्राक्कथन

यह भारतीय कृषि सांख्यिकीय अनुसंधान संस्थान, सूचना-पत्र खण्ड नौ का प्रथम अंक है। इसमें इस संस्थान की जनवरी-मार्च, 1983 की तिमाही गतिविधियों से सम्बन्धित जानकारी का विवरण दिया गया है।

मुझे आशा है कि यह सूचना पत्र कृषि अनुसंधान सांख्यिकीविदों तथा अन्य प्रयोक्ताओं के लिए लाभदायक सिद्व हो रहा है। मुझे यह सूचित करते हुए हर्ष हो रहा है कि इस अंक से आगे के अंकों में अनुसंधान कर्त्ताओं के लाभ के लिए एक नया अध्याय "अध्ययन गोष्ठी वार्ताओं का सारांश" (Abstracts of Seminar Talks) आरम्भ कर रहे है। इसके अगले अंकों, में सुधार लाने हेतु किसी भी प्रकार की टिप्पणी और सुझावों का मैं आभार सहित स्वागत करुँगा।

मैं संस्थान के उन सब अधिकारियों तथा उन सदस्यों का आभारी हूँ, जिन्होंने भा० कृ० सां० अ० सं० सांख्यिकीय सूचना-पत्र के इस अंक के लिए अपेक्षित सामग्री प्रदान की है।

मैं श्री सोम दत्त, श्री महाराज सिंह काकरन, श्री अनिल कुमार भल्ला और श्री रधुबर दत्त का भी आभारी हूँ, जिन्होंने इस सूचना-पत्र के संकलन एवं मुद्रण में अपना भरपूर सहयोग दिया है।

प्रेम नारायण
निदेशक,
भा० कृ० सां० अ० सं०,
नई दिल्ली-110012

PREFACE

This is Vol IX, No. 1 issue of 'IASRI Statistical Newsletter' and covers the activities and allied information in respect of this Institute during the quarter January-March, 1983.

I hope this Newsletter has been proving useful to the Agricultural Research Statisticians and other users. I am glad to inform that a new chapter "Abstracts of Seminar Talks", has been introduced from this issue onwards for the benefits of the Research Workers. I would welcome and appreciate any comments and suggestions for its improvement in the subsequent issues.

I am thankful to all officers and other members of the staff of the Institute who supplied the requisite material for this issue of the "IASRI Statistical Newsletter".

I am also thankful to S/Shri Som Dutt, M.S. Kakran, Anil Kumar Bhalla and Shri R. Dutt for the help rendered in compilation and printing of this Newsletter.

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CONTENTS

1. LABOUR UTILISATION IN MAINTENANCE OF POULTRY AND EGG PRODUCTION IN COMMERCIAL POULTRY FARMS

The Indian Agricultural Statistics Research Institute carried out two pilot surveys for the estimation of cost of production of poultry and eggs at the commercial poultry farms in Hoshiarpur district (Punjab) and Delhi area during the Fourth Plan period. A detailed study on utilisation of labour in poultry keeping was made using the secondary data collected in these surveys. The study provided information on pattern of distribution of human labour on relationship between productivity and labour input and also on norms on labour utilisation for properly channelising the available labour. Some of the salient results are discussed in the following paragraphs.

The data from 119 farms in Punjab and 101 in Delhi for one complete year were utilised. In Punjab 103 farms utilised only family labour (type I), 2 only paid labour (type II) and 14 both paid as well as family labour (type III) whereas in Delhi these figures were 43, 24 and 34 respectively. In farms which utilised only family labour, poultry keeping was the main occupation of 11 per cent of the adult male workers and 1 per cent of female workers in Punjab and 17 per cent of males and 16 per cent of females in Delhi About 40 per cent males and 36 per cent females in Punjab and 36 per cent males and 30 per cent females in Delhi had poultry keeping as their subsidiary occupation.

Out of the total available family labour 44 per cent of men and 25 per cent of women in Punjab and 50 per cent of men and 33 per cent of women in Delhi were engaged in the poultry work. In Punjab about 71.7 per cent of the total labour force were men, 26.6 per cent women and 1.7 per cent children while in Delhli about 82 per cent of the total labour force were men and the rest women. The extent of utilisation of man labour was more than that of woman in all types of farms. The participation of labour was almost of the same order in each season.

The correlation coefficient between egg production and labour input was 0.68 in Punjab and 0.86 in Delhi. Taking egg production as dependent variable and labour input as an independent variable, it was found that the Cobb-Douglas function accounted for maximum percentage of variation in respect of farms managed by only family labour and only paid labour.

In order to work out norms on labour utilisation different categories of birds were converted to standard bird i.e,. 'layer' on the basis of feed intake of each category of birds. This was done with the help of the ratios 1.00:0.33:0.62:0.76:0.83:1.04:0.98 in Punjab and 1.00:0.39:0.40:0.65:0.75:0.84:1.04 in Delhi which a layer holds with bird

upto 8 weeks of age, young bird of age group 8-12 weeks, 12-16 weeks, 16-20 weeks and 20-24 weeks and adult male bird respectively. Similarly the labour put in by a man was taken as the standard labour and the labour put in by woman and child was converted to this standard on the basis of wage rates. The ratios of wage rates of man woman and child labour were 1.00:0.85:0.75 in Punjab and 1.00:0.84:0.71 in Delhi. Considering those set of farms where the productivity per bird was higher than the overall average, it was found that the average time required per standard bird per day was about 1 minute in farms utilising only family labour in Punjab and Delhi and about 0.8 minute and 0.7 minute in farms utilising only paid labour and both family as well as paid labour respectively in Delhi. The requirement of time for maintainig other categories of birds could now be obtained by making use of the ratios used for the standardisation of different categories of birds.

2. ADOPTION OF IMPROVED AGRICULTURAL TECHNOLOGY IN RICE PRODUCTION IN RAIPUR DISTRICT OF M P.

The green revolution in Indian Agriculture from 1965-66 onwards heralded an increase in the productivity of wheat and rice crops. This was possible due to the adoption of high yielding varieties and chemical fertilisers. However the manner in which benefits of new technology is distributed among different regions of the country and among different classes of people is also an important component of development process. It is also observed that the gap between the potential and actual productivity is high in most of the areas.

For making productivity movement more meaningful it will be necessary to identify the key constraints responsible for the gap. The present study examines the gap between the potential yield and average yield obtained on farmers fields on rice crop. The data for the study pertains to kharif, 1978-79 and has been obtained on the basis of household survey of 72 sampled cultivators conducted in 4 villages, namely, Bhatagaon, Rakhi, Charmudia and Bhothali in Kurud block of Raipur district of M.P. These villages are covered under the O.R.P. on the integrated control of rice pests. The improved cultivation practices or operations whose adoption (singly or in combinations) was examined for assessing the adoption level of improved technology by the farmers in the area is as under:-

(i) cultivation of high-yielding variety (S.M.R.) seeds.
(ii) application of chemical fertilisers and
(iii) application of plant protection chemicals.

These are the major components of modern technology which are being propagated as package of practices under the O.R.P. for attaining higher yields on farmers fields.

Accordingly the selected farm households were classified into the following 3 groups :

1. Adopting any one of the improved practices,
2. Adopting any two of the improved practices, and
3. Adopting all the three of the improved practices.

About 7 per cent of the selected farmers did not adopt any improved cultivation practices for rice cultivation. 47 per cent of cultivators in the first category obtained average yield of 679 kg/hectare. 33 per cent of the cultivators were those who adopted any two of the improved cultivation practices and the average yield obtained by them was 722 kg. per hectare. By adopting all the three improved cultivation practices the average yield increased to 864 kg/hectare although adoption rate was only 13 per cent. The overall average yield was 703 kg/hectare and it was less by about 5170 kg/hectare of potential yield.

From the above study it can be concluded that by adopting the new technology the productivity level of rice cultivation can be increased. The technology will be more fruitful when its suitability to various areas or regions is determined. Since the study area is endemic to gallmidge as such the propagation of varieties resistant to this pest should be undertaken on a large scale The growing of community nurseries should be encouraged. The entension agencies may educate fully the farmers about raising of rice crop by modern technology. Provision of key inputs at right time and in right quantity and at appropriate prices will also encourage farmers in obtaining higher crop yield.

3. TRAINING AND BASIC RESEARCH

3.1 Training activities :

Special lectures/training programmes were arranged for the students and trainees of the UNESCO (through CSO), ISS and UNESCO (through NCERT)

3.2 Basic Research :

Some sampling designs have been studied for estimating the multiple characters.

3.3 Hostel Activities :

The students of IASRI hostels observed Saraswati Puja on 18th February, 1983. A cultural programme was organised in the evening in which students of the hostel participated. Dr P.V. Sukhatme was the Chief Guest on this occasion. Dr. Mukhtar Singh, Emeritus Scientist, P.A.U., Ludhiana and other distinguished guests graced the occasion.

A contingent of 45 students from I.A.S.R.I. participated in 3rd Inter Institutional I.C.A.R. students sports meet at N.D.R.I. Karnal from 2nd to 5th March, 1983. The students bagged silver medals in Hockey and Chess. Shri N.S. Solanky, a student of Advanced Diploma in Computer-programming, won a gold medal in 800 Metre race, a silver medal in 1500 Meter race and a bronze medal in 3000 Metre race.

4. ADVISORY SERVICES

During the quarter under review, technical advice and guidance was rendered to research workers and students of the Research Institutes, Agricultural Universities and other Research organisations in planning of their experimental investigations and statistical analysis/computerisation of their research data as also in regard to research projects referred to the Institute by the ICAR and other organisations. Some details of the technical advice and guidance given by the Institute are given below in brief:-

4.1 Animal Sciences :

Technical advice was given to Dr. S.P. Singh, Department of Botany, Meerut University, regarding analysis plan of field trial data on potato.

4.2 Sample Survey Methodology :

(i) Advice given to programme officer, Ford Foundation on planning/implementation of survey for study of "Performance of Monitoring of Warabandi system of Irrigation" in operation in Kaithal and Hissar (Haryana).

(ii) Advice given to "Task Force Group for study to indentify constraints in wheat production", on sampling procedure for selection of units at different stages and preparation of proformae for data collection, etc.

4.3 Econometric Analysis :

(i) Technical advice was given to Sh. M.C. Goel, Institute of Applied Manpower Research, New Delhi, regarding his project on Assessment of Trained Manpower needs for Agricultural Planning and Analysis.

(ii) Technical advice was given to Shri R.K. Bose from Tata Engineering Research Institute, New Delhi regarding estimating industrial production function.

5. FIELD SURVEY WORK

5.1 Field Training :

During the quarter under review, field training was imparted in connection with the projects mentioned below at the places shown against them:

(i) Pilot study for developing a suitable methodology for estimation of cost of cultivation of fodder crops, Jullundhur, Punjab.

(ii) Study of performance of Monitoring of Warabandi system of Irrigation"-Kaithal, Hissar (Haryana).

(iii) All India Coordinated Agronomic Research Project-Aligarh (U.P.).

5.2 Field Work Inspection/Supervision :

During the period under report the field work of the following schemes was inspected/supervised by the officers of the field unit at the places/areas mentioned against them:

1. Pilot Sample Survey to study the impact of National Demonstration Trials on Crop productlon in Rohtak district of Haryana.

2. Pilot Sample Survey to study the impact of floods on agricultural production in a region of U.P. (districts of Faizabad and Balia).

3. Pilot survey to study the performance of cross-bred cattle under village condition in Palampur area (Himachal Pradesh).

4. Index of Cost of production of Milk, I.C.D. area, Bhopal (Madhya Pradesh).

5. Pilot sample survey on cost of production of Banana/Mango and its marketing practices in Surat and Bulsar district of Gujarat.

6. National Index of Animal Experiments-R.B.S. College, Bichpuri, Agra (U.P.).

7 All India Coordinated Agronomic Research Project, Aligarh (U.P.).

6. ABSTRACTS OF SEMINAR TALKS

During the quarter under review, 17 seminar talks were delivered by the Scientists/ Staff/Students of the Institute on various topics of interest in the fields of Agricultural Statistics and allied disciplines. The abstracts of Seminar talks are given below:

6.1 Seminar Talks delivered by the Ph. D./M Sc. Students

6.1.1 Agricultural Statistics :

(a) Ph. D. :

(i) AGARWAL, S.K.-Inference for some incompletely specified models involving normal approximations to poisson data.

Bancroft (1944) was the first to study the overall properties of inference procedure which incorporated a preliminary test of significance with the subsequent inference of primary interest. In 1956 he designated such procedures as 'inferences for incompletely specified models'. The estimation problem for continuous data (Normally distributed data) was discussed by Mosteller (1948). In this seminar the theory for two samples from $N(\mu_i, \sigma^2)$ $i=1,2$, σ^2 assumed known and the parameter of interest being μ_i, will be discussed using a preliminary test of significance (PTS) at level α to test $\mu_1=\mu_2$ a new estimator $\bar{x}^*$ is proposed both to estimate μ_1 and to test the hypothesis $\mu_1=\mu_0$. These results are then applied to data from distribution (in particular to Poisson) which can be approximated after suitable transformation by normal distribution with known variance.

(ii) BALAKRISHNAN, K.A.- Correlation approach for analysis of Genotype-environment interactions.

Various methods have been proposed for the Statistical analysis of Genotype-environment interactions. One of them which is to express G E. interactions in terms of genetic correlation of the same character measured in two or more environments as suggested by Falconer (1952). Robertson (1959) gave the theoretical basis of Falconer idea and provided the estimation formula and its standard error. Yamada (1962) divided the necessary correlations required in the formula when some of the assumptions like equal heritability or homogeneity of variances between environments, made in Robertson model, do not hold good. These methods are discussed in this talk.

(iii) DWIVEDI, V.K.- Robust estimation in finite population.

The general aim in Robust estimation is to find an estimator or a strategy that performs well in some broad sense allowing for our uncertaintly about the real world. Comparison of efficiencies is also involved in Robust estimation. Comparison of p-unbiased or approximately p-unbiased strategies were discussed in this talk.

(iv) HAQUE, M.N - Linear model: Estimation variance components.

In random effect model, the interest lies in the estimation of the variance of the effects and not the estimation of the individual effects or their contrasts. Some methods of estimation of variance components in balanced as well as unbalanced data were discussed.

(v) MAHAJAN, R. K. - Review of some developments in sampling theory.

At the end of nineteenth century, sample survey was in its infancy and there was an extensive debate under the heading of the 'Representative Method' about the scientific validity of any form of sampling from finite populations. Bowley (1926) proposed two representative methods, (i) purposive sampling and (ii) stratified random sampling. Neyman (1934), apart from his other contributions in sample surveys, compared purposive sampling with stratified random sampling and was able to establish that purposive sampling had failed to give satisfactory results.

Horvitz and Thompson (1952) noted that the concept of a linear estimator, as mentioned, was not as straightforward as it appeared to be. They proposed three classes of linear estimators. Godambe (1955) showed that no MVUE could exist for all possible populations.

In the absence of a UMVUE, the concepts like sufficiency (Basu, 1958), likelihood function (Godambe, 1966) and admissibility (Godambe, 1960,) Roy and Chakravarti, 1960) were introduced. In this talk, an account of these advances was given.

If non-additive gene effects are of major importance for yield, then selection for specific combining ability and development of double cross hybrids from such composites are likely to be a more effective breeding procedure. On the other hand, if the additive genetic variance is predominant or appreciable, intra population mass selection fullsib family selection or selection for general combining ability would be more effective. A situation may also exist when both additive and non-additive types of gene action are equally operative. Under these conditions reciprocal recurrent selection may be most effective for the improvement of maize population.

(vi) MALLIK, T.- Two way elimination of heterogeneity.

A general method of analysis of non-orthogonal three way designs (designs eliminating heterogeneity in two directions) will be discussed. The definition of Efficiency Balanced, Three way designs, analogous to the efffciency balanced block designs was explained.

(vii) RAO, K.V.S.- The Misunderstood split-plot.

There is often a misunderstanding of the relationship of Statistical design and the role of confounding on the resulting statistical analysis and inferences. Since split-plot with multitude of variation is commonly occurring in such experimental designs, it is selected as a basis to discuss appropriate statistical procedures and analysis. For mainly more understanding, text-book split-plot and split block experimental designs, are defined alongwith ANOVA. Latter alternate ANOVA, alternate experimental designs for whole plots and split-plots were discussed, The dependence of split-plot and

whole-plot analysis of variance was considered. Finally there algorithems are given for keying out the degree of freedom in ANOVA for computing sum of squares in ANOVA and for determining appropriate error variance.

(b) M. Sc. :

(i) CHAUDHARY, N - On the formation of clusters.

In some situations although the lists of elements (and not of cluster) in a population is available, cluster sampling is used in surveys for the sake of convenience or economy and the clusters have to be formed artificially The available procedures for cluster formation are of two categories (i) Clustering before sampling (CBS) in which N non-overlapping cluster of M elements each are first formed from N elements of the population and then a random sample of n clusters is selected (ii) Clusters after sampling (CAS) in which first a random sample of n elements is selected from the population and then clusters are formed with each of these n elements according to some suitable criterion and these n clusters constitute the sample When the population is large and cluster is small CAS will be much more cheap and convenient as compared to CBS. In this talk the problem of formation of clusters has been discussed in detail and an attempt has been made to study the efficiency of various procedures of forming clusters

(ii) NEGI, (Miss) MALTI - 'Phylogenetic analysis of cattle breeds'

Some of the earliest published papers on cattle immunogenetics have established the value of immunogenetic research in studying evolutionary relationships. Out of a number of blood group system loci studied, the B-locus has been the one most commonly used to study the Breed relationship. Generally these studies measure similarity by the relative number of B-locus alleles common to the breeds Since there are over 400 distinguishable alleles at this locus, these comparisons can define very complex inter-relationship of breeds.

In addition to the blood group system, other immunogenetic systems have also been used to establish the inter-relationship Until recently, no method was existing for simultaneously utilising available gene frequency data on several loci to study the phylogenetic inter-relationship of cattle populations. In a series of papers Cavalli and Sforza and W F. Edwards have presented a genetic approach for studying the relationships of closely related populationship. Kenneth Key Kidd has studied the evolutionary inter-relationship of sixteen breeds and seven breeds of cattle

using the methods suggested at Cavalli and Sforza. Cavalli and Sforza have utilised the differences in gene frequencies among human and cattle populations as the basis for measuring evolutionary difference among these populations.

Khanna and Singh (1980) used the method of cluster analysis to study the evolutionary relationship of Indian Cattle Breed using the gene frequency data available at I.V.R.I., Izatnagar.

Some of the methods proposed for phylogenetic study were discussed in the present talk.

(iii) RAVICHANDRAN, S - Allocations in stratified sampling by means of Linear Programming.

In this talk, a paper by Svein Nordbotten (1956) was discussed. The purpose of this paper was to indicate how a well-known problem in the theory of sampling can be formulated as a problem of linear programming, namely, the use of linear programming technique for the allocation of sample in stratified sampling.

(iv) RAVICHANDRAN, S.- On a simple procedure of unequal probability sampling without replacement.

A simple procedure of unequal probability sampling without replacement was proposed by J.N.K. Rao, H O. Hartley of Iowa State University and W.G. Cochran of Harward University in 1962. It leads to an estimator of the population total having a smaller variance than is obtained by sampling with replacement. Other advantages of this method are simplicity of calculation and the possibility of estimating exactly the variance of the estimator. This method was reviewed in this talk.

(v) SHEKHAWAT, SUDHIR - Studies in systematic sampling for two dimensional finite population.

This seminar topic dealt with comparing efficiencies of different sampling schemes for estimating mean of a finite population spread in space and time. For the type of data studies in this topic and the pattern of intra-class correlations revealed by the data over time, it has been found that two-stage sampling design with special units (villages) as secondary sampling units, selected in the form of a systematic sample is the optimum feasible design The optimum interval of systematic sampling are found to be 5 or 6 days both being equally efficient. Systematic sampling with alternative or weekly intervals has been found to be the worst sampling scheme.

(vi) SINGH, NEELAM KUMAR - Combination of Ratio and PPS estimators.

It is well-known that suitable use of auxiliary information in probability sampling results in considerable reduction in variance of the estimator of population mean/total. If there are more than one auxiliary characters, the problem remains as to how the entire information can be utilised in a better way.

In the present talk, two auxiliary characters have been used in different ways, *viz.*, one for the purpose of selection at the sample and other for the purpose of estimation and then suitably combining the PPS and ratio estimators so obtained, to estimate the population mean, so that the mean squared error of the estimate is minimum. Following this approach an estimator, combining ratio and PPS estimator of the population mean has been proposed and it has been proved that the proposed estimator would always be more precise than either PPS estimator or ratio estimator under PPS sampling scheme.

(vii) SUDHANSHU, A.K.-A note on prediction in the case of finite populations.

Regression relations are of considerable importance for predicting the value of one variable on the basis of given value of an auxiliary variable. In the literature on regression analysis it is assumed that the population under consideration is infinite which is not the case always. In the present seminar, we study the general problem of regression analysis when the population is finite. The expressions for the variance of regression predictor have been worked out for various situations depending on how the value of the auxiliary variate is chosen.

6.1.2 Agricultural Engineering :

Ph. D. :

SRIVASTAVA, A.P.-Statistics of Plant spacings produced by planters.

Establishment of proper population densities in field crops is one of the foremost requirement for good yield. A stochastic model for planting system to characterise the plant spacing thus becomes a design criteria for a planter's performance and the subsequent decisions for thinning device Corn, cucumber and sugarbeet populations were predicted and tested against field observations.

6.1.3 Genetics :

Ph. D. :-

CHAUDHURY, S.K.-Estimation of genetic variability in heterozygous maize population.

The development of an effective plant breeding programme is dependent upon the existence of genetic variability. In earlier years apparent variability was the only criterion of variability available. This was inadequate since environmental and genetic variabilities, in the absence of some form of progeny test, were confounded. Methods are now available for a partition of either means or variance which provide information as to the presence or absence of genetic variability and in addition, provide information on the type or types of gene action involved. In the present talk, some of the methods available in the area were reviewed.

A useful method for estimating type of gene action is provided by variance component analysis. The first report of this topic was by Fisher (1918), Wright (1935) and many others contributed to advancement in this area. The methods were extensively used by animal breeders, but largely ignored by plant breeders. An interest in quantitative genetics developed in 1940 s following the publication of Comstock and Robinson (1948) Comstock *et al* (1949) and later by Comstock and Robinson (1952), Kempthorne (1957), Mathur and Links (1971) and others.

Many studies have investigated the extent of genetic variability available in different types of maize population. Most were conducted by use of mating design suggested by Comstock and Robinson (1948,1952). The North Caroline Designs of Comstock and Robinson provided an unique opportunity to the maize workers to measure the relative importance of the various component of genetic variance and based on this basic information to decide on the future course of breeding programme Presence of substantial proportion of additive genetic variance in heterozygous materials has been adequately demonstrated and the relative dominance was observed to be in the dominance to partial dominance range.

6 1.4 Agricultural Physics :

Ph. D. :-

CHAND, RAMESH-Statistical Methods in Soil Classification Research.

The purpose of classification is to organise large population into groups so that the relationship between objects can be understood more easily. Two important statistical methods used in soil classification are cluster analysis (numerical texonomy) and

ordination of soils. Numerical texonomy as defined by Sneath and Sokal (1973) is the grouping by numerical methods of texonomic units into texa on the basis of their characteristic state. Data for a number of units (soil profiles) are assembled and arranged into matrix consistency of soils by columns and soil properties by rows. After numerical values for the estimate of resemblance between all pairs of soils are obtained, the matrix is subjected to sorting strategy. The relationship can be presented in various ways e.g. dendrougrams, recorded matrices, ordination etc. Two types of ordination used in soil studies are Q-type and R-type of ordination. In R-type ordination Principal Factor Analysis (PFA) has been much less frequently used than Principal Component Analysis (PCA) in soil studies.

7. ABSTRACTS OF PAPERS PUBLISHED BY THE SCIENTISTS OF THIS INSTITUTE

7.1 NADKARNI, U.G., ARYA, S.N. and ABRAHAM, JOSE - Comparative Structure of Bovine Population in Rural Areas with and without I C.D.P. - *Indian Dairyman, 34 (12), pp. 297-303.*

The paper gives comparative information on the structure of bovine populations in an Intensive Cattle Development (ICD) area and a non-ICD area of Punjab. The results are based on analysis of data collected through a survey and pertain to sex ratio, breed composition, age distribution and proportion of animals in milk separately for cattle and buffaloes. Need and scope for improvement of bovine stock in the non-ICD area are indicated.

7.2 PRAKASH, ANAND and BOKIL, S.D. - Estimation of production of Cultivated fodders - *Agricultural Situation in India, Feb , 1983*

In order to develop a sampling methodology for estimation of area and production of fodder crops, a pilot sample survey was undertaken during the years 1972-73 and 1974-75 in districts of Meerut and Karnal covered by Intensive Cattle Development programmes. The results of the survey demonstrate the capability of the sample survey technique to provide essential information regarding fodder crops as also guidance for formulation of surveys to be taken up in other regions in future

An important feature of these surveys is that the problem of repeated cuttings in case of these fodder crops was tackled by making the plot in advance in the selected field and harvesting it at the stage when the cultivator had already harvested the adjoining area of the plot.

These pilot investigations were first of their kind in the country.

7.3 PRASAD V.S.S., NIVSARKAR, A.E., SINGH, R.N., BOHRA, S.D.J. and KUMAR MAHESH - Body conformation and carcass characteristics of native and cross bred lambs on a high energy ration. *Indian J. Anim. Sci 53 (2): pp. 156-161, February, 1983.*

One hundred and twenty-six male lambs representing 11 genetic groups were fed on a ration containing 9.04% DCP and 69 29% TDN from 91 days of age to 180 days, and slaughtered on 181st day. Genetic group differences for 7 live lamb measurements and 9 carcass traits were studied. Correlations were determined between each measurement and carcass trait. Genetic group differences were observed for all the body measurements except body length and the circumference of the thigh. Carcass characters except the loin-eye area and the weight of neck and shoulder significantly differed between genetic groups. Dorset crosses (half breds and F_2s) with Sonadi and Suffolk half-breds with Sonadi and Malpura were heavier at slaughter and also yielded heavier carcasses than natives and other crosses. Slaughter weight was significantly ($P < 0.01$) correlated with all the live lamb measurements, carcass weight, joint weights and loin-eye area. The results also indicated that the circumference of the thigh and width of the loin could be of predictive value for dressing percentage and per cent bones in lamb carcasses.

7.4 RAHEJA, S K., MEHROTRA, P.C., AHUJA, D L. and RUSTOGI, V.S - A Statistical appraisal of the performance of HYV wheat in selected districts of Haryana - *Food Farming and Agriculture, January, 1982, Vol. XIV, No. 7. pp. 103-11.*

In this paper an attempt has been made to study the (i) yield trend of HYV of wheat, (ii) adoption of associated cultivation practices and (iii) the additional income received by farmers in the cultivation of high yielding varieties with the help of data collected under the assessment surveys on high yielding varieties programme in the three selected districts of Haryana State *viz*, Hissar, Rohtak and Ambala during 1969-70 to 1973-74. The study showed that Kalyan Sona was the most extensively grown HYV of wheat in all the three districts except in Ambala where the proportion of fields under this variety declined form 1971-72 onwards. The average yield of HYV showed a falling trend in all the three districts over the five years except during 1971-72 in Hissar and during 1970-71 in Rohtak. The main reasons for the falling trend in the average yield during 1972-73 and 1973-74 were severe drought conditions and short supply of power. All the fields under HYV received nitrogen in all the three districts. However, the proportion of fields receiving phosphorus was rather too low and that receiving potash was rare in all the three districts. The doses of nitrogen applied were much less than

those recommended while those for P and K were fairy close to the recommended ones. It was also observed that the average yield performance of HYV wheat and fertiliser use were alomst neutral to scale. The net profit accruing to the cultivators using HYV seeds ranged between Rs. 173/-and Rs. 810/-per hectare while the return per rupee invested was between Rs. 2.31 and Rs. 5 56 in the three districts.

7.5 RAUT, K. C. and SINGH, SHIVTAR - Loss in Milk Production due to Mortality of Milch Stock in Rural Areas *Indian J, Anim. Sci. 53: (2). pp. 135 138, February,1983.*

A methodology for estimating the loss in milk production due to untimely death of cows and buffaloes has been suggested utilising data collected during sample surveyes in Hissar district (Haryana), Krishna delta area (Andhra Pradesh), Dhulia region (Maharashtra), I.C.D. area of Bikaner (Rajasthan) and I.C.D. area of Bhopal (Madhya Pradesh). The rate of mortality was 4.6 to 5.9 per cent for cows and 3 0 to 6.5 per cent for buffaloes. The distribution of deaths, average life of an animal in terms of age and calvings as well as lactation yield were worked out. The estimated loss was 1.25 to 1 60 per cent for cow milk and 1.0 to 1.61 per cent for buffalo milk.

7.6 RAUT, K. C., SINGH, SHIVTAR and CHANDRA, VIMAL - Calf Mortality affects milk production. *Indian Farming. Feburary, 1983*

Data collected in a large scale sample survey conducted by IASRI during 1975-77 for estimation of cost of production of milk in I. C. D. area, Bhopal have been utilised for this investigation. It has been found out that calf mortality during the lactation period adversely affects the milk yield and other production traits Even in the case of buffaloes which are considered to be the main dairy animals in the country, there is a substantial difference in the the yield betweeen the animals with and without calves.

7.7 SUKHATME, P. V. and NARAIN, PREM - A possible Genetic Interpretation of the Auto-Regulatory Mechanism in Models for Protein Deficiency. *Proc. Indian Natn. Sci Acad. B48, No. 6, pp. 748-754. 1982*

The Inter-and intra-individual variability with serially correlated observations, as for instance with nitrogen balance on successive days for a number of individuals, were studied theoretically with particular reference to component of variance due to interaction between the genetic constitution of the individual and the environment provided by day-to-day food intake. The intra-individual variability was enhanced as a result of the interaction and it was related characteristically with changes in the serial

correlation coefficient and the length of the sequence of day-to-day observations. Based on these considerations, it is argued that the strength of the interaction can be measured in terms of the serial correlation coefficient signifying the degree of auto-regulatory mechanism in nutrition studies.

8. STATISTICAL ABSTRACTS OF PAPERS PUBLISHED BY THE SCIENTISTS OTHER THAN OF THIS INSTITUTE

Considering the requirement of the Research Workers and Scientists in the field of Agricultural Statistics, this chapter giving abstracts of articles relating to agricultural statistics or other related studies and published in various journals by the scientists other than of this Institute was introduced from the last issue. The topics of the articles are broadly on Sample Survey (Theory and application, including good case studies, if any), Design of Experiments (all aspects including combinatorial aspects) Statistical Genetics, Plant and Animal Breeding (with sufficiently new statistical methodology), Statistical inference, sequential analysis and Stochastic Process with biological applications, etc., Econometrics and Computer Services and Numerical Analysis, etc

During the quarter under report the following articles published in various journals were abstracted by the Scientists of this Institute whose names are given at the end of each abstract.

8.1 WOOD, CONSTANCEL and CADY, FOSTER B. - Intersite Transfer of Estimated Response Surface - *Biometrics, 37, pp. I-10 March, 1981.*

Transferability of agronotechnology assumes the feasibility of extrapolating a respon e-input relationship, estimated from experimental sites, to other sites with similar conditions. One specific conjecture is that crop production technology is transferable across sites within a soil family classification. The general approach to evaluating the transfer conjecture involves incorporating into the data analysis, the prediction of yields not used in the estimation of the transfer function. A transfer model, using a second-order response surface and measured site variable information, is formulated, and the yield for each experimental site is predicted from a transfer function estimated from the other sites. The resulting transfer residuals are compared with the ordinary within-site residuals. Based on a sum-of-squares criterion a prediction test statistic is doveloped and shown to have a distribution of a ration of independent quadratic forms. The methodology of transfer residuals is applied to data from the Bench mark Soils Project, where major objective is to assess the feasibility of transfering agronotechnology among sites having soil of the same texonomic classification.

(Abstracted by-Sh. H.C. JAIN)

8,2 BHAT, P.N., KUMAR, RAJENDRA and KAUL, G.L. - Measures of persistency of milk yield in Murrah Buffaloes. *Indian J. Anim. Sci. 52(8): pp 621-627, August, 1982.*

Weekly milk yield records of 449 Murrah buffaloes during their first 6 lactations from 4 military dairy farms *viz.*, Ambala, Jhansi, Jabalpur and Lucknow over 6 years from 1966 to 1971 were utilised for estimating persistency of milk yield by 8 different methods to find out whether the methods used in cattle could be satisfactorily used for measuring persistency in buffaloes The eight methods adopted for estimating persistency were as follows :

P_1 - Lactation period of 44 weeks is divided into 22 bi-weekly segments. Suppose $X_1, X_2 \ldots\ldots\ldots\ldots X_{22}$ are the yields of the 22 segments of a lactation curve, then 21 Ratios $R_1, R_2 \ldots\ldots\ldots\ldots R_{21}$ would be $R_1 = \frac{X_2}{X_1}$, $R_2 = \frac{X_3}{X_2}$, $\ldots\ldots\ldots\ldots$ $R_{21} = \frac{X_{22}}{X_{21}}$. The relative weight (W) for these were calculated as

$W_1 = \frac{R_1}{R_1+R_2+\ldots\ldots\ldots+R_{21}}$, $W_2 = \frac{R_2}{R_1+R_2+\ldots\ldots\ldots+R_{21}}$ $\ldots\ldots\ldots\ldots$ Then $P_1 = (W_1 R_1 + W_2 R_2 + \ldots\ldots\ldots W_{21} R_{21})$

P_2 - In this method, the entire lactation curve was devided into 11 segments, each of 4 weeks duration and the persistency P_2 was calculated as under P_1.

P_3 - In this method the entire lactation curve was divided in to 4 segments, each of 11 weeks duration, and the persistency P_3 was calculated as under P_1.

P_4 - It was calculated as $P_4 = \frac{A-B}{B}$ where A is the yield during the first 26 weeks and B is the yield upto peak.

P_5 - It is calculated as $P_5 = \frac{a-b}{b}$ where 'a' is the total milk yield in 308 days and 'b' is the milk yield upto peak.

$$P_6 = \frac{\text{Milk yield from 15th to 28th week}}{\text{Milk yield from 1st to 14th week}}$$

$$P_7 = \frac{\text{Milk yield from 29th to 42nd week}}{\text{Milk yield from 1st to 14th week}}$$

$$P_8 = \frac{\text{Average daily yield till peak yield}}{\text{Average daily yield in the remaining part of the lactation}}$$

Mean persistency indices varied from 0.673 $\pm$ 0.006 to 4.637$\pm$0.109. Farms, sequence of lactation and years of calving had significant influence on measures of persistency. The estimates of heritability for persistency of milk yield were nearly zero or negative indicating that persistency is primarily influenced by the managemental factors rather than the hereditary factors.

(Abstracted by Sh. J.C. Malhotra)

8.3 GREGORY, K. E. and TRAIL, J. C. M. - Rotation cross-breeding with Sahiwal and Ayrshire cattle in the Tropics, *Journal of Dairy Science 64, pp 10-12, 1981*

A basic objective of cross-breeding systems in cattle is optimum use of both non-additive (heterosis) and additive (breed differences) effects of genes. The objective of this study was to compare breeding groups that were approximately 67% Ayrshire 33% Sahiwal or approximatlely 33% Ayrshire-67% Sahiwal in the humid part of the semi-arid to humid ecological zone of Africa. Characters used in the analysis were age at first calving, calving interval, lactation yield, annual lactation yield, birth weight, average daily gain from birth to 50 kg, average daily gain from 50 to 90 kg, average daily gain from birth to 90 kg and calf survival. The 33% Sahiwal, 67% Ayrshire breeding group had a significant advantage over the 67% Sahiwal-33%Ayrshire breeding group in all characters except calf survival, calving interval, and birth weight.

(Abstracted by Sh. L.K. Garg)

8.4 KRUOGGAL, W. G., FIELD, R. A. MILLER, G. J. HORTON, K. M. & BUSBOOM, J. R.- Influence of sex and diet on Lutein and lamb fat. *Jour. of Animal Science, Vol. 54, No. 5, May, 1982*

High levels of xanthophylls in lamb/sheep fat result in yellow colour. Such fat is not preferred by consumers. The yellow colour is believed to be the result of concentration of lutein in the sheep diet The present study attempts to investigate the influence of diet on sheep fat. Sixty four rams and wether lambs were fed with corn which is a high energy diet and with alfalfa which is low energy diet. The lambs

were slaughtered at 60 to 80 Kg body weight for the required assessment. It was observed that the fat from lambs which were given corn diet had less lutein than the fat from lambs which were given alfalfa diet. This is because alfalfa has high content of lutein compared to corn. It was observed that if the lambs were castrated before reaching the age of 60 days, the yellow fat caused by the high lutein levels can be decreased.

Lutein content of the feeds given to rams and wethers was found to have a high positive correlation with fat colour The correlations between the lutein contents of the ram feeds and the fatty acids, flavour and fat colour were found to be higher than the correlations between the lutein content of the feeds given to wethers and the fatty acids, flavour and fat colour.

This paper cites 30 references on related studies.

(Abstracted by Sh. L.B.S. Somayazulu)

8.5 PANDEY R. M. - Genetic Associations in Amaranthus. - *Indian J. of Genetics and Plant Breeding, 41, pp 78-83, 1981.*

Genotypic and phenotypic coefficient of correlation in respect of six varieties and their 30 F_1's and 30 F_2's have been studied. The characters considered for study were (i) number of days to flowering (ii) plant height (cm) (iii) number of panicle/plant, (iv) length of panicle (cm) (v) Weight of grains/panicle (g) (vi) number of days to maturity, (vii) 1,000 grains weight (g) (viii) grain yield/plant (g) (ix) harvest index (%) and (x) Pollen fertility (%). In the present population grain yield had very high positive correlations both Genotypic and Phenotypic coefficients with number of days to flowering, plant height and number of days to maturity. In case of number of panicles/plant, genotypic correlation was low but Phenotypic correlation coefficient was significantly high but negatively associated with weight of grains/panicle and 1000 grains weight. In cass of F_1, yield was found to have significantly positive association with Plant height, weight of grain/panicle and 1000 grain weight had significantly positive genotypic correlation but non-significant positive Phenotypic coorrelation. In case of F_2 Plant height and number of panicles/ Plant had significantly positive associations with grain yield. Number of panicles/Plant both in F_1 and F_2 showed positive correlation with plant height and length of panicle. It was further found that weight of grains/panticle, number of days to maturity, 1000 grain weight, pollen fertility were negatively associated with all the characters in F_1 and F_2 generations. So the selection for these characters would adversely effect the

economic Potential. It was observed that both the coefficients were indentical in direction but genotypic correlation was higher in magnitude. It was also observed that selection based on yield components would not adversely affect the quality traits along with yield improvement due to the significant positive correlation in plant height, weight of grains/panicle, 1000 gram weight, harvest index in F_1 and number of days to flowering, plant height, number of panicles/plant and harvest index in F_2. The possibility of developing, high yielding short or medium statured, early maturing lines was indicated by non-significant genotypic correlation of number days to flowering and plant height with economic traits if the number of panicles are not affected. But the positive correlations between height and number of panicles/plant and the days to flowering hindered in selection of short-statured and early maturing plants with more panicles/plant.

(Abstracted by Sh. P.S. Rana)

8.6 ROWLINSON, P. and BRYANT, M.J.- Lactational Oesturs in the sow-2. The influence of group-housing, boar presence and feeding level upon the occurrence of oesturs in lactating sows. *Anim Prod., Vol. 34, Part 3, June, 1982, pp2 83-90.*

A 2 X 2 X 2 factorial design was used to study the relative influence of housing system (group or singly housed; G or S), boar presence (boar present or absent; B or N) and feeding level (*ad libitum* or restricted; A or R) upon the occurrence of oestrus in lactating sows. The treatments were given from day 20 post partum until weaning at day 42.

Each cell of the design contained between 21 and 24 animals, giving approximately 90 animals for the comparison of main effects. A total of 183 Camborough hybrid adult female pigs of mixed parity was used Only sows with litters of seven or more piglets at day 20 were included in the experiment. The occurrence of oestrus behaviour was determined by the testing of all sows with vasectomized boars for 5 minutes daily in a separate pen.

The proportion of sows showing oestrus during lactation was greater for the group compared with the singly housed sows ($P<0.01$) and for sows in the presence of a boar ($P<0.05$). Although there was a tendency for a greater incidence in ad libitum compared with restricted-fed sows, the difference was not statistically significant. The only treatment in which a high proportion of sows (0.78) showed oestrus was the combination G-B-A which differed significantly from all other combinations when the sows were singly-housed as well as the combination G-N-A-($P<0.05$).

It was seen that all these management factors are necessary for a high incidence of oestrus in lactating sows. Although both group-housing and boar presence appear independently to increase the possibility of oestrus behaviour occurring in lactating sows, it is only in combination and with a high food intake that a majority of sows may be expected to respond.

(Abstracted by Sh. T. B. JAIN)

8 7 STRITZKE, DEBI J. and WHITEMAN, JOE V.-Lamb growth patterns following different seasons of birth. *Jour. of Anim. Sci, Vol. 55, No. 5, Nov., 1982.*

The object of the study was to compare the growth performance of 457, 5 0 and 640 lambs born during three seasons-fall, winter and summer. The data in respect of the three traits viz., birth weight (BW), 70-d weaning weight and post weaning avg, daily gain (ADG) of lambs were collected during the fall of 1974 through the winter of 1979 to determine if there were important interactions between season and sex, type of birth or rearing.

At the start, in all, 246 mature ewes (3 and 4 years old) were exposed to 37 rams for breeding during the seven breeding season from 1974 to 1978. The ewes types were five combinations of Rombouillet (R), Dorset (D) and (or) Finnish Landrace (F). The ewes were kept in average body condition through supplemental feeding in all seasons to enable the lambs to attain maximum growth. Lambs were managed and fed alike during the period.

Resultes seggest that bred lambs born during different seasons varied in birth weight ($P \leqslant 0.01$) and for 70-d weight ($P \simeq 07$). Large year within season variation for post weaning ADG contributed to inconclusive results for seasonal effects On comparison, it was found that winter-born lambs were .33 kg heavier at birth than summer born lambs and 1.28 kg heavier than fall-born lambs. And at 70-d of age, winter-born lambs weighted 2.93 kg more than fall-born lambs and 3 79 more than summer-born lambs. An interaction between sex and season was observed for ADG ($P < .01$). There was a smaller average difference (40 g/d) between ram and ewe lambs born in the summer than between rain and ewe lambs (90g/d) born during the fall and winter. Sex and (birth-rearing) type adjustment factors did not seem to vary among seasons for BW and 70-d weight. Only the adjustment of ADG for sex appeared to depend on the season of birth of the lamb.

(Abstracted by Sh S.P. VERMA)

8.8 FEINGOLD, MARCIA-' Missing data in linear models with correlated errors''- *Commun. Statist. - Theor. Meth., 11(24), pp 2831 2843 (1982).*

Yates (1933) gave a method for analysis of experimental designs data when some of the observations are missing. This method provides the correct error sum of squares and a positively biased hypothesis sum of squares. Kshirsagar (1971) worked on the bias in hypothesis sum of squares. The present paper extends these results to the case of a general linear model under the assumption of a non-singular covariance matrix that is known up to a scalar factor. The equations for this model are converted into a form that is congruent to that for the simpler model. In this way, the results of Yates and Kshirsagar for an independent error model can also be used for analysis of missing observations in case of a more general model.

(Abstracted by Sh. R.C. Jain)

8.9 MATLOFF, NORMAN S.-James-Stein Regression Estimation in a Prediction context- *Commun. Statist, - Simula. Computta. 11(5), 1982.*

The paper deals with two types of shrunken estimators of regression co-efficient vector $\underline{\beta}$ for the case in which X and Y, have a joint distribution with regression function $E(Y/X=t) = t'\beta = t_1\beta_1 + t_2\beta_2 + \ldots t_p\beta_p$ [under the assumption that $E(X)=0$, $V(Y/X=t)=\sigma^2$] and involving the use of predictor variables X's as stochastic variables. The first estimator $\hat{\beta}^{(0)}$, for which all components are shrunhen equally is of the form $K\hat{\beta}$, where $\hat{\beta}$ is ordinary least square estimator of $\underline{\beta}$ and K, whicn lies in the range $(0 \leqslant K \leqslant 1)$, is so chosen that the expected squared prediction error is minimised. The second proposed estimator $\hat{\beta}(G)$ is of the form $K_1\hat{\beta}_1 + K_2\hat{\beta}_2 + \ldots + K_p\hat{\beta}_p$ to covers the case for unequal shrinkage in β's. These estimators have been compared with $\hat{\beta}$ using computer simulations in which samples are taken from artificial populations of known structure. The study showed that for the various sampling situations of interest, both the shrunken estimates have been found to be superior over ordinary least square estimator $\hat{\beta}$ in all such situations in that the mean squared prediction error for $\hat{\beta}$ decreased by as much as 35% and mean squared estimation error for $\hat{\beta}$ decreased by as much as 85%. Further, these estimators have also been discussed for situations like multicollinearity, small sample size and large error variance.

(Abstracted by Sh. Chandrahas)

8.10 NORDBERG, LIENNART - On variable selection in generalised linear and related regression models - *Commun. Statist. Theor. Meth. 11 (21), pp. 2427-2449. 1982*

The paper deals with the procedures for selection of explanatory variables in a wide class of generalised linear models (GLM) which covers models like the ordinary linear regression model, the binary logistic regression model, the probit model and the poisson regression model with linear or log-linear parameter structure. The procedure suggested is that of an approximation of log-likelihood function and certain data transformation by which it has been shown in the paper that the problem of variable selection in GLM can be converted to that of variable selection in case of ordinary unweighted linear regression model, the procedures for which have been extensively developed. The paper thus obviates the need for resort to be specific computer programmes for variable selection under GLM and instead shows the reasivility of using some suitable variable selection programme for linear regression. In this regard the paper gives the results of as imulated study which shows the suitability of log-likelihood approximation in many practical situations. The paper also provides the explicit form of data transformation in the case of GLM class of models. Towards the end, the paper provides the procedure for checking the suggested approximation for a given set of data that for modifying it when the approximation is judged to be poor.

(Abstracted by Sh R. C Jain)

8.11 SALAMA, IBRAHIM and QUADE, DANA-A non-parametric comparison of two multiple regressions by means of a weighted measure of correlation. - *Commun. Statist. Theory Metho., 11 (11), pp. 1185-11953, 1982*

The paper gives a method of comparing the rankings of regressors in two populations. This involves carrying out stepwise regression of the sample data pertaining to each population, and then obtaining the ranks of regressors according to their importance. If the rankings of m regressors for the two populations be denoted by R_1j, R_2j .....R_mj for $j=1,2$ and T_k for $k=1,.....,m$ equals the number of regressors having rank $\leqslant k$ according to both the rankings then $T=\frac{\Sigma T_k}{k}$ is a measure of weighted rank correlation which gives greater weight to regressors having low rank compared to those having high rank. The use of a weighted rank correlation measure like T as against the prevalent use of the ranks has been shown to be useful for comparing the orderings of regressors in 2 multiple regressions The paper also discusses the distribution of T and gives tables of exact critical values of T alongwith their approximate values for practical use. Further, the use of statistic T has been extended for comparing the rankings of regressors for more than two populations.

(Abstracted by Mrs. Ranjana Agarwal)

8.12 SMITH, THEODORE M. - Distribution-free test procedures for s^K factorial experiments, *Communications in Statistics - Theory and Methods II, No. 4, pp. 439-443, 1982*

In a s^K factorial experiment, with s being prime or prime power, each effect can be represented by a pencil, P $(a_1 \ldots\ldots\ldots\ldots, a_k)$ with a_i E (belongs to) GF(s). The pencil divides the set of s^K different treatment combinations into s subsets each of s^{K-1} treatment combinations. If within each replication the observations with each subset are added together, then a test of whether the effect is zero is equivalent to testing for equality of location among the totals from the subsets. If the distribution of the error term is continuous then any sample rank test for location will be distribution-free under the null hypothesis. The ranks may be based either upon ranking these sums among all replications or upon ranking these sums only within a replication. In case no replication effect is suspected the Mann-Whitney-Wilcoxon test may be useful, otherwise, Wilcoxon signed test or Friendman rank statistic may be used.

The procedure is illustrated through data from a 2^2 design. Some further extensions are also suggested.

(Abstracted by Dr. A. K. Nigam)

8.13 JOLLIFFE, IAN T. - A note on the use of principal components in regression. *Applied Statistics, 31, No. 3, pp. 300 303, 1982.*

The idea of using principal components in regression is to replace the original regressor variables by their principal components, thus orthogonalizing the regression problem and introducing computational ease. The principal components are treated as regressor variables and those found to be associated with the dependent variables are included. In, recent publications the suggested rule for inclusion is simply based on the variances of the components. The components with large variances are retained and those with small variances are rejected. Through this rule of inclusion, there is very little loss of predictiveness in the regression.

The argument proposed in this article is that small variance components may have predictive value. It has been demonstrated through examples that the principal components with small variances can be as important as those with large variances. Of the four examples considered in the current article, three have already appeared in the literature.

(Abstracted by Dr. V. K. Gupta)

8.14 CHOI, S. C. - Practical tests for comparing two proportions with incomplete data. *Applied Statistics, 31, No. 3, pp. 256-262, 1982*

In paired comparisons, various mechanisms cause the data to be partially incomplete. This article suggests six simple hand calculable test procedures and the likehoodli ratio criterion for testing the equality of two binomial proportions with partially incomplete paired data. The test statistics are asymptotically N (0,1), with one exception in which the test statistic has a Chi-square distribution with four degrees of freedom.

Tha adequacy and powers of the tests are examined for moderate sample sizes using simultation. 400 independent sets of samples are generated for various combinations of parameters. The pre-assigned significance level is $\alpha = 0.05$.

The result of the simultations suggest that each test appears to be more or less satisfactory in terms of the size with possible exception of the likelihood ratio test Tests which discard some of the observations have small power than those utilising all the observations. An interesting finding of the study is that for tests involving paired data, the power increases with correlation co-efficient, other parameters being fixed.

The proposed tests, however, lead to possible biased results if the mechanism causing incompleteness in the data is related to the treatment under investigation. In such a case a test ignoring the incomplete data may be a little safer, though the power of such a test will be small.

Finally, the tests may be applied with the usual continuity corrections, particularly when the proportions being tested are small.

(Abstracted by Dr. V. K Gupta)

8.15 AGARWAL, S. and RAJARAMAN, V. - Computer Aided Design of Logical Base for Information Systems. *Journal of Computer Science and Informatics, Vol. 13, No. 1 January, 1983*

In the paper a systematic procedure to design the logical data base for a specified information system has been developed. The method begins with using a computer program to print reports required by a user in the specified format including dummy data so that the reports shown to the user truly represent what he would ultimately receive. Changes in report formats are easily accommodated at this stage. This program also generates a list of data items required to produce the reports. Another computer program

compares this list with elementary data items available from the input documents and those which could be derived from these to identify surplus and/or deficient data. After the system analyst rectifies these surplus and deficiencies, a third program organises the data into sets as per the DBTG specifications.

(Abstracted by Sh. K V. Sathe)

8.16 BHATNAGAR, S. C. and RAMANI, K. V. - Suitability of Micro Computers for Data Processing. *Journal of the Computer Society of India, Vol. 9, No.* 1 & 2, 1980.

The computing power available in the country has been increasing at a rapid rate. The latest additions to the computing equipments are the micro computers which are being marketed by several manufacturers. Micro computers are comparatively inexpensive machines providing the capabilities of a mini computer. Hence an important question that needs to be answered is whether these machines are suitable for data processing applications. Since about 30 to 70% of the total computing time in business application is spent in sorting master/transaction files, the suitablity of these machines for data processing depends critically on the design of a good sort package.

In this paper two designs of a sort package for implementations on micro computers with 2 diskette drives and 3 diskette drives have been presented. From the sort designers point of view the task is sufficiently challenging because in micro computers the main memory is very restricted and the auxiliary storage is also limited and comparatively slower. The designs have been compared by computing synthetic time estimates with the help of a simulator under varying data environments and system configurations. This analysis of time estimates will provide useful insight to the user as well as the manufacturers of micro computer systems. For the user as such analysis would be useful to evaluate a given configuration in terms of his own data processing needs. For the manufacturers this analysis provides a definite indication of the type of configuration design that should be proposed for different market segments.

(Abstracted by Sh. K. V. Sathe)

8.17 GOYAL, R. C., KURUVILLA, J., HARIDAS, S. D. and LAXMINARASIMHAN, A. L. - Processing Load Estimation, Configuratian Determination, Job Scheduling and Shift Planning Package. *Journal of the Computer Society of India, Vol. 9, Nos.* 1 & 2, 1980

The selectian of a suitable computer system is a multistage process. The user had to identify the current and future applications intended for implementation on the system. The transaction processing volumes are estimated and the preliminary system design is

carlied out. A data base containing hardware characteristics, software details and the results of various benchmarks of the computer systems being offered by various vendors has been developed. This package determines the hardware resources (configuration) and the processing timings in order to process the applications at prescribed frequencies and the estimated transaction volumes. The processing timings are calculated over a long period usually one year, in order to provide accurate shift planning and job scheduling The various configuration for the specified vendors and their computer systems are considered and the processing timings estimates, shift planning etc. thus determined by the package are analysed. An optimum configuration is selected which will satisfy the environmental, operational and economic constraints as specified by the customer.

The package is mainly intended to be used by micro processor community.

(Abstracted by Sh. K. V. Sathe)

9. ABSTRACT OF DISSERTATION APPROVED

Ph. D.

9.1 KUMAR, PRANESH - Some Investigations in Unequal Probability Sampling Designs.

In sample surveys, the theory of unequal probabilities play an important role in sample selection as well as in estimation with higher precisions. In view of Hervitz and Thomposon (1952) estimator, unequal probability sampling procedures without replacement are advantageous if inclusion probabilities are proportional to sizes. In the present dissertation, some aspects of unequal probability sampling without replacement are considered. Followed by a critical review of the literature on unequal probability sampling, two sample selection procedures for selecting two units from the finite populations using unequal brobabilities, are given Both the selection procedures provide a class of sampling schemes, IPPS as well as non-IPPS. The sampling schemes belonging to these classes admit a non-negative unbiased variance estimator of the Horvitz and Thomposon's estimator due to Yates and Grundy (1953). A necessary and sufficient condition for the IPPS schemes of the classes to have greater efficiency than the IPPS with replacement scheme is derived. Many sampling schemes, for instance those due to Midzuno (1952), Sen (1952), Durbin (1953), Rao (1965), Singh (1978) belong to the suggested classes. Some new IPPS sampling schemes emerging from these classes are considered and are found satisfactory with respect to efficiency and stab:lity of the variance estimator when compared empirically with some of the known sampling schemes.

Further, an improvement over Horvitz and Thomposon's estimator, is suggested for Non-IPPS sampling scheme. The problem of estimating the variance of the Horvitz and Thamposon's estimator when second order inclusion probabilities are either difficult to obtain or they do not admit an explicit form or are zero for some of the pairs is also dealt. Some estimators of the variance which do not depend upon second order inclusion probabilities, are suggested Since the estimators are biased, their relative biases along with those of some other biased estimators of variance available in literature, are empirically studied.

(Guide : Dr. A. K. Srivastava)

10. PAPERS ACCEPTED FOR PUBLICATION

10.1 MAINI, J. S. and GOEL, B. B. P. S. - Estimation of pig population and number of pigs slaughtered using random sampling technique. *Indian Jour. of Animal Sciences.*

10.2 NADKARNI, U. G., SOMAYAZULU, L. B. S., JAIN, T. B., GUPTA, H. C. and AGARWAL, S.C. - On cost of maintenance of pigs. *Indian Jour. of Animal Sciences.*

10 3 SINGH, SHIVTAR and RAUT. K. C - Life time economics of cross-bred and non-descript cows in a rural area. *Indian Farming.*

10.4 SOMAYAZULU, L. B. S. and AGARWAL, S. C. - Study of growth of large white Yorkshire and land race pigs under different feeding levels. *Indian Jour. of Animal Sciences.*

11 COMPUTER SCIENCE & NUMERICAL ANALYSIS

11.1 Data Processing :

During the quarter under report, the Division of Computer Science & Numerical Analysis continued ro provide facilities for data analysis and computer programming to the scientists, research workers and students from various Institutes under I.C.A.R., Agri. Universities and colleges, Directorate of Economics and Statistics, Min. of Agriculture and Deptt. of Agri., U.P. State. A few user's were allowed to utilise the computer systems on payment basis.

11.2 Computer utilisation :

During the quarter under report, about 4100 production jobs and 950 testing jobs were processed on B-4700 and IBM 1620 Computer systems.

11.3 Programming facilities :

Programming facilities and guidence in data analysis on computer were given to 47, Ph D., 28 M.Sc. students and 17 other research workers during the quarter. Four programs were developed to meet the users requirements.

11.4 M T. Unit :

Mechanical tabulations unit continued to give facilities for data preparation and processing of cards on unit record machines for research workers from IASRI and other Institutes. About 3.5 lakhs cards were punched and 632 jobs were processed on various unit record machines.

12. PAPERS PRESENTED AT INTER-ORGANISATIONAL SEMINARS, CONFERENCES, WORK-SHOPS, ETC.

The title and authorship of papers presented and the particulars of the Workshops, seminars at which these were presented, are given below:

12.1 The 70th Session of the Indian Science Congress Association held at Tirupati from January 3-8, 1983

12 1.1 Section of Statistics.

(1) JAIN, R C and DAS M.N -Confounded asymmetrical factorials using truncated incomplete block designs.

(2) NARAIN, PREM,-Presidential Address entitled, "Stochastic Problems and Methods in population Genetics".

(3) NARAIN, PREM, MALHOTRA, P K. and WAHI, S.D.-The use of Auxiliary Traits in Combined Selection.

(4) SRIVASTAVA, A.K. and DEY, A-A sampling procedure with inclusion probabilities proportional to size.

(5) TALUKDAR, J., NARAIN, PREM and SRIVASTAVA, A.K.-Some aspects of sampling techniques for multiple character in repeat surveys.

(a) The symposium on "Inventary of Oceanic Resources in relation to Man's Development and needs".
NARAIN, PREM, KATHURIA, O.P. and SHASTRI, S.S.-Data requirement for studying the dynamics of exploited marine fisheries.

(b) The symposium on "Statistical Anthropology"
NARAIN PREM.-Scope sf Statistics in Anthropology.

(c) The symposium organised under the committee on Science and Economic Development.
NARAIN, PREM-Economic Aspects of Oceans and Seas both Realised and Potential food and water.

(d) The Symposium on "Recent contributions in sample survey methodology."
SRIVASTAVA, A.K.-Use of auxiliary information in survey sampling -A review of some recent trends.

12.2 All India workshop on Crop Losses due to Insect Pests, held at A.P.A.U., Rajendra Nagar Hyderabad (A.P.) from January 7-9, 1983.
NARAIN, PREM and KHOSLA, R.K -Statistical analysis for estimation of crop losses due to pests and diseases.

12.3 36th Annual Conference of Indian Society of Agricultural Statistics held at Mahatma Phule Agricultural University, Rahuri, Maharashtra on January 17-20, 1983.

(i) AGARWAL, ELLA, BANERJEE, A.K. and DEY, A.-An empirical study on the performance of some sampling strategies using an auxiliary information.

(ii) AGARWAL, RANJANA and SINGH, PADAM-A sampling scheme with inclusion probability proportional to size using PPS systematic sampling.

(iii) BANERJEE, A K. and RAHEJA, S.K.-Some statistical investigations relating to causes of idle land in India

(iv) BHATNAGAR, K.C and BANERJEE, A K.-Optimum points or stratification for estimating yield of cereal crops.

(v) BOSE, R.K , BANERJEE, A.K. and DEY, A.-A simple rule for stratification.

(vi) DEY, A. and BANERJEE, A.K.-Construction of a series of symmetrical group divisible designs.

(vii) JAIN, R.C., AGRAWAL, RANJANA and SREEDHARAN, H.-Use of Principal Component in yield forecast.

(viii) JAIN, T.B. and BHATIA, D.K.-Employment absorption in poultry keeping around Delhi.

(ix) KARANDHIKAR, V.R., RANA, P,S and BATRA, P.K.-A study on size and shape of plot for Jowar.

(x) KATHURIA, O.P., BATHLA, H.V.L. and SINGH, J.-Responses of groundnut and rapeseed-mustard to irrigation and fertilizers and on prospects of achieving their sixth plan production targets.

(xi) KHATRI, R.S.- A comparative study of population size, estimators and their effeciencies.

(xii) KUMAR, PRANESH and SRIVASTAVA, A.K.-A General class of unequal probabilities without replacement sampling schemes for two units from finite populations.

(xiii) MATHUR, D.C., SRIVASTAVA, A.K. and SINGH, JAGMOHAN-A study on the economics of vegetable cultivation in rural areas of Delhi.

(xiv) RAHEJA, S.K, MEHROTRA, P.C. and BASSI, G.S.-A study of variability in yield of groundnut in Aurangabad.

(xv) RAHEJA, S.K., RUSTAGI, V.S. and MEHROTRA, P.C.-Yield performance of bajra hybrids under different lands of irrigation.

(xvi) RAHEJA, S.K., MEHROTRA, P.C. and SATYA PAL-On estimation of straw to grain ratio for jowar crop.

(xvii) RAHEJA, S.K., MEHROTRA, P.C. and TYAGI, K.K. On construction of adoption index of improved agricultural practices.

(xviii) RAI, S.C.-Optimum number of Comparisons in Paired and Triad Experiments

(xix) RANA, P.S.-A quenening problem with heterogeneous services.

(xx) RAUT, K.C.-Decomposition of enhanced milk yield according to sources of increase.

(xxi) SARUP, SHANTI, PANDEY, R.K. and VERMA, GEETAM-Statistical evaluation of pulses in Madhya Pradesh-production trends in recent years.

(xxii) SAXENA, B.C., NARAIN, PREM and SRIVASTAVA, A K.-Robustness of Hartley's estimator for multiple Frame Surveys.

(xxiii) SHASTRI, S.S.-A study on successively sampling procedure for estimating the change in mean.

(xxiv) SINGH, H.P., JAIN, J.P. and SAXENA, B.C.-A further study for estimating changes in dynamic population.

(xxv) SINGH, JAGMOHAN, SRIVASTAVA, A.K. and MATHUR, D.C.-Utilization of human labour in vegetable cultivation in rural areas of Delhi.

(xxvi) SINGH, RANDHIR-Estimation from incomplete multiple observations.

(xxvii) SINGH, SHIVTAR, RAUT, K C. and AGARWAL, H.O -Study on growth of cross-bred and indigenous calves reared in a rural area.

12.3.1 "Symposium on crop weather relation-ship".

(i) AGRAWAL, RANJANA, JAIN, R.C and JHA, M.P. -Models for studying effects of weather on crop yield.

(ii) BHARGAVA, P.N. and SAKSENA, ASHA-System analysis approach for crop planning in rainfed areas.

12.3 2 "Symposium on Statistical aspects on post harvest technology".

(i) GOEL, B.B.P.S., and SINGH, K.B. -Post harvest losses in Milk and dung.

(ii) NARAIN, PREM and KHOSLA, R.K. -Estimation of Foodgrain losses at different Post-Harvest Stages.

(iii) RAHEJA, S.K. and MEHROTRA, P.C -Food grain losses in storage at farm level.

12.4 "National Symposium on Breeding Livestock for economic efficiency and Twenty Second Annual General Conference of Indian Society of Animal Genetics and Breeding held at Haryana Agricultural University, Hissar from 11th to 13th March, 1983,

(i) NARAIN, PREM, and MALHOTRA, J.C. Cost-benefit evaluation of Progeny testing programmes under Indian Conditions

(ii) NARAIN, PREM, MALHOTRA, P.K. and WALIA, S.D. -The use of auxiliary traits in Combined selection for improvement in poultry.

13. CONFERENCE/SEMINAR/SYMPOSIUM/WORKSHOP, ETC, ATTENDED BY THE SCIENTISTS

Date	Name of Conference/Seminars/ Symposia, etc.	Name of the Scientist with Designation
Jan., 3 to 8	70th Session of Indian Science Congress Association held at Tirupati.	Dr. Prem Narain, Director* Dr. O.P Kathuria, Scientist (S-3) Dr. A.K. Srivastava, Scientist (S 2) Sh. R.C. Jain, Scientist (S-1)
Jan., 17 to 20	36th Annual Conference of Indian Society of Agricultual	Dr.Prem Narain, Director Sh. P.N. Bhargava** Scientist (S-3)

Date	Name of Conference/Seminars/ Symposia, etc.	Name of the Scientist with Designation
	Statistics held at Mahatma Phule Agricultural University, Rahuri, Maharashtra.	Dr. K.C. Raut, Scientist (S-3) Sh. R.K. Khosla,*** Scientist (S-2) Dr. Randhir Singh, Scientist (S-2) Dr. H V.L. Bathla, Scientist (S-2) Smt Ranjana Agrawal, Scientist (S-2) Sh. K.B. Singh, Scientist (S-1) Sh. H.B. Choudhry, Scientist (S-1) Sh. P.S. Rana, Scientist (S-1) Sh. S.N. Bajpai, (T-5)
March. 11 to 13.	National Symposium on "Breeding Livestock in Economic Efficiency" and Twenty second Annual Conf. of the Indian Society of Animal Genetics and Breeding. held at Haryana Agricultural Univ , Hissar.	Dr. Prem Narain, Director+ Sh. J.C. Malhotra Scientist (S-2) Sh. P.K Malhotra, Scientist S-1)

* President in the section of statistics.

** Convener of Symposium on Crop Weather relationship with reference to rain-fed agriculture', held at M.P.A U., Rahuri on Jan. 18, 1983.

*** Convener of Symposium on 'Statistical Aspects of Post Harvest Technology' held at M.P.A.U. Rahuri on Jan., 19, 1983.

\+ Chairman of the Two technical Sessions.

14. LIBRARY

14.1 During the period under report 177 books on various subject field of the Instt, were added to the Library.

14.2 Following reprints written by the Scientists of our Institute and published in Scientific Journals were procured for free distribution by the library among the scientists working in the same field on exchange basis.

S. No.	Author	Title	Source
i)	Agarwal, Veena, and Dey, A	Note on orthogonal main effect plans for Asymmetrical factorials	Sankhya: Indian Jr. Stat. 44.Sr. B Pt. 3, 1982.
ii)	Chawla, G C. and Rajagopalan, M	Sequential sampling of non-overlapping clusters-clustering after selection.	Jr. of Indian Socy. Agri. Stat. 34 (2) Aug. 1982.
iii)	Raut, K.C.	Nutritional studies of buffaloes under village conditions in Dhulia region of Maharashtra	Ind. Jr. Ani. Sci. 52(12) Dec., 1982
iv)	Raut, K.C.	Management indicators in respect of housing of buffaloes for milk production	Ind. Jr. Ani. Sci. 52 (11) Nov., 1982.
v)	Singh, R. P. and Ram Gopal	Note on reasonal effect on calving and production traits of buffaloes under village conditions.	Ind. Jr, Ani. Sci. 52 (8) 1982.

14.3 As a part of continuous practice the library has got bound 581 books and Journals etc, for better preservation.

14.4 The Reprographic unit of the libray has attended 77 Jobs covering 1750 pages sent by the scientific, technical and Administrative Officers of the Institute.

14.5 The issue and return work at the library counter has involved transactions of approx. 8000 publications.

14.6 During the aforesaid period approx., 6650 persons visited the library for consultation purposes.

15. LAB-TO-LAND PROGRAMME

Under the ICAR Lab to-Land Programme the Institute carried out the following activities in village Nilothi of Delhi during the quarter under report:-

15.1 Demonstrations on balanced cattle feed (HAFED) :

Demonstrations on balanced cattle feed (HAFED) were carried out in 160 households belonging to the categories of landless labourers and small and marginal farmers adopted under the programme. The results were found quite satisfactory and showed that milk yield increased by 2—3 kg per animal per day with 2 kg. of feed given to the buffalo in place of the normal concentrate.

15.2 Demonstrations on cultivation of summer moong :

There was no practice of cultivating summer moong in the village and the lands mostly remain/fallow after harvest of wheat in rabi season. The cultivators have now been persuaded to take up the cultivation of summer moong as a cash crop before sowing of kharif crop. About 40 demonstrations on cultivations of summer moong (PS-16 variety) in as many holdings are proposed to be laid out in the coming summer season. Steps have also been taken to arrange supply of inputs like seed, bacterial culture and fertilizer for based application.

15.3 Demonstration on short duration variety of arhar :

The cultivators were also motivated to take up cultivation of short duration arhar during the forthcoming kharif season. About 10 demonstrations are proposed to be laid out for the purpose. Arrangement to procure seeds of appropriate variety is being made.

15.4 Demonstration on cultivation of hybird maize :

About 17 cultivators have shown interest in cultivation of hybrid maize. Arrangements to procure and supply seeds of appropriate maize hybrids are being made.

15.5 Creation of self-employment opportunities and vocational training of village youths and women :

Under the vocational training programme arranged and run by Delhi Administration, applications of more than 100 village youths and women have been forwarded to the concerned authorities for imparting training in different vocations as mentioned below. The application are being processed and the training programmes are likely to commence shortly.

S No.	Name of the vocation	No. of application forwarded
i)	Driving	30
ii)	Soap making	6
iii)	Loan for tonga and bullock cart	2
iv)	Poultry	2
v)	Khadi weaving	3
vi)	Candle making	6
vii)	Loan of purchase of buffalo	3
viii)	Tailoring	18
ix)	Embroidry	4
x)	Food and nutrition programme	25
xi)	Knitting	4
xii)	Loan for establishment of shop	1

15 6 Visit to Krishi Vigyan Mela :

A visit of adopted farmers from the village Nilothi was arranged to the Krishi Vigyan Mela organised by IARI from 16th to 18th March, 1983. 26 farmers visited the mela and were shown around different stalls and demonstration plots. The latest developments in the field of agricultural implements, seed technology and other aspects were also demonstrated, use of bio-gas for heating, lighting and working the pumps sets were also demonstrated to the farmers. Literature and pamphlets relating to the package of improved practices for different crops was also supplied to the cultivators on the spot.

15.7 Programme of levelling and land shape :

There are about 15 acres of land lying idle/uncultivated in the village on account of undulating field level and gradients. To bring this area under cultivation, arrangements are being made to undertake levelling of the land to improve its productivity.

16. MISCELLANEOUS

16.1 Personnel Information:

16 1.1 Promotion/Transfer, etc.

(i) Following Technical Assistants have been inducted into Grade 'S' of A.R.S. in the pay scale of Rs. 550-900 and transferred to other Institutes w.e.f. the date mentioned against each:

1.	Sh. N.K. Sharma	15-1-1983	I.V.R.I , Izatnagar
2.	Sh. M.S. Narang	15-1-1983	-do-
3.	Sh. R.N. Sood	28-1-1983	I.G.F.R.I., Jhansi
4.	Sh. Indra Singh	11-3-1983	-do-

(ii) S/Shri Snehanshu Sen Gupta and S.P. Jain, Technical Assistants of this Institute have been appointed as Programme Assistant on deputation in the office of R.G. of India, Min. of Home Affairs, in the pay scale of Rs. 550-900 and were relieved of their duties at I A.S.R.I. on 15.3. 1983. (A.N.)

16.1.2 The Scientists of I.A.S.R.I. were deputed to attend training/study tour/meeting and to deliver lectures, etc , during January-March, 1983.

(i) Dr. Prem Narain, Director	(i) Attended the 22nd Convocation of Post-Graduate School of Indian Agricultural Research Institute, New Delhi held on 7-2-1983.
	(ii) Attended as Chairman of the Judging Committee for the Bhonoji Ramars Debate Contest entitled "The present course curricular education system has failed to produce excellence in Agricultural Research" organised by the Chemistry Students Association in the Division of Soil Science & Agricultural Chemistry of IARI, New Delhi held on 26th Feb., 1983.

		(iii) Delivered lectures at Institute for Research in Medical Statistics (ICMR), Ansari Nagar, New Delhi in 'Population Genetics' on 3rd, 4th, and 5th March, 1983.
		(iv) Attended as a Member, the second meeting of the National Advisory Board on Statistics held at Department of Statistics, Sardar Patel Bhawan, New Delhi on 4th March, 1983.
		(v) Attended the final meeting of the Achievement and Audit Committee of the Central Marine Fisheries Research Institute at Madras on 14th March, 1983.
		(vi) Attended as Chairman, the meeting of the Technical Committee of Direction for the improvement of Animal Husbandry Statistics in the country held on 26th March,1983 at Krishi Bhavan, New Delhi.
(ii)	Dr. S.S. Pillai, Jt. Director	(i) Gave a series of 12 lectures on sampling techniques to the participants of 'National Household Survey Capability Programme' training programme conducted by C.S.O. from 17th to 24th Jan, 1983.
		(ii) Delivered a lecture on Data Base Management Systems to the ISS Probationers on 19th March, 1983 at R.K. Puram Computer Centre.
(iii)	Dr. S.K. Raheja, Scientist (S-3)	(i) Delivered a lecture on "Sample Surveys in Agriculture & Animal Husbandry" to the Senior P.G. Students, Department of Statistics, Punjab University, Chandigarh on 4th March, 1983.
		(ii) Delivered a lecture on "Economies of Fertilizer Use" at 28th FAI Marketing Management Programme for Fertilizer Marketing Executives on 8th March, 1983.

(iv)	Sh. S.D. Bokil, Scientist (S-3)	Attended the meetings of inter-ministerial experts on Crop Insurance held on 10th and 11th March, 1983 (on behalf of the Institute).
(v)	Dr. J.P. Jain, Scientist (S-3)	(i) Delivered a lecture to ISS trainees from CSO, New Delhi on 22nd Jan., 1983. (ii) Apprised the P.G. Students of Statistics, Punjab Univ. Chandigarh about the activities of the Division of Animal Sciences.
(vi)	Dr.O.P. Kathuria, Scientist (S-3)	Delivered lectures to CSO trainees on 21st and 25th January, 1983 and foreign trainees of NCERT on 28th January, 1983 at the IASRI, New Delhi.
(vii)	Miss C R. Leelavathi, Scientist (S-2)	(i) Delivered a lecture to ISS trainees on 22nd Jan, 1983 at IASRI, Delhi, on Statistical Research in Crop Sciences. (ii) Delivered a lecture to Foreign trainees sponsored by CSO on 25th Jan., 1983 at IASRI, New Delhi on Statistical Research in Crop Sciences
(viii)	Dr. A.K. Banerjee, Scientist (S-2)	Delivered four lectures on Stratified Sampling to the participants of the National Household Survey Capability Programme at CSO, New Delhi in Jan , 1983.
(ix)	Dr. J.S. Maini, Scientist (S-2)	(i) Delivered two lectures in the "National Household Survey Capability Programme" conducted by CSO with practical Assignment from 27th and 28th, Jan., 1983, (ii) Attended the meeting of the technical Committee of Direction for improvement of Animal Husbandry Statistics held at Krishi Bhawan, New Delhi on 26th March, 1983.
(x)	Sh. P.C. Mehrotra, Scientist (S-2)	Delivered a lecture (with practical Assignment) on two stage sampling to the students sponsored by the CSO under the "National Household Survey Capability Programme" on 17th February, 1983.

(xi)	Sh. R.K. Khosla, Scientist (S-2)	Delivered a lecture on surveys on corp losses and crop forecasting to trainees of CSO on March 1, 1983 at the IASRI, New Delhi
(xii)	Dr. A.K. Srivastava, Scientist (S-2)	(i) Delivered a series of lectures on the following topics to the participants of a training programme on "National Household Capability Programme" organised by CSO on 7th to 11th, 14th and 15th Feb., 1983. (a) Ratio and Regression Estimators (b) Two Stage Sampling (c) Cost and Variance functions-estimation of sample size. (ii) Delivered lectures to the participants in the training Course in "Sample Survey Methods in the Area of Education" organised by NCERT at R.E.C Ajmer on 2nd and 3rd March, 1983.

16.2 Distinguished Visitors:

16.2.1 Dr. P.C. Joshi, Asstt. Professor, I.I.T., Kanpur, visited IASRI on 31st January, 1983 and delivered a seminar talk on "Outlier detection in linear models."

16.2.2 A French Delegation consisting of Dr. E. Salmon-Legagneur and Dr. Michel Arraudean visited IASRI on 8.2.1983 and discussed with the Director regarding the possible areas in the field of Agricultural Statistics in which French Govt. might like to collaborate with the Indian Government.

16.2.3 Dr. K.L. Mati, Jt. Director, Poultry, Government of Madhya Pradesh, Bhopal visited the Institute on 17.3.83 for discussing the progress of the Reciprocal Recurrent Selection Programme for 1982 as well as formulating a new breeding programme for evolving a deshi bird suitable for tribal and rural areas of Madhya Pradesh. The advice was given and the breeding programme was prepared.

16.2.4 Dr. B.D. Tikkiwal, Professor (Stat.), Rajasthan University, Jaipur, visited IASRI on 26th March, 1983 and delivered a seminar talk entitled," A new approach on teaching of Courses in sample surveys".

16.3 Monitoring Cell :

A meeting of the Monitoring Cell was held on 14th February, 1983.

The Monitoring Cell discharged the responsibility of getting the RPF proformae filled in from the scientists of some of the Divisions for onward transmission to ICAR.

In addition, the budget allocation for the 22 projects under the co-ordinated scheme on Primary Data Collection involving ad-hoc Field Staff was revised.

16.4 Staff Research Council :

A special meeting of the Staff Research Council was held on 18th February, 1983 for acquainting the Chairman and members of Q.R.T. with its functioning.

16.5 Joint Council :

Jt. Staff Council was reconstituted for a period of three years w e.f. 13 1. 1983. The elected and nominated members of the same are follows.

I Director. IASRI Chairman

II Official side

1) Dr. M.P. Jha, Scientist (S-3)
2) Sh. P.N. Bhargava, Scientist (S-3)
3) C. A. O.
4) Accounts Officer
5) Shri S.C. Rai, Scientist (S-2)
6) Sh. S.S. Shastri, Scientist (S-1) and Secretary (Official side)

III Elected members

1) Sh. Onkar Saroop, Scientist (S)
2) Sh. D.C. Pant, E.C.O. (T-5)
3) Sh. R.D Garg, Tech Asstt. (Stat.) T-11-3
4) Sh. Mangal Singh, T-1-3

5) Sh. Prem Lal, T-1-3
6) Sh. D.N. Kharbanda Asstt.
7) Sn. Prem Shankar Rai, Jr. Clerk
8) Sh. Ram Paras Mehto, S.S. Grade-II
9) Sh. Ved Prakash, S.S Grade-I

The Chairman and members of Q.R.T. met the members of IASRI, Jt Council on 18th Feb, 1983 at IASRI. The meeting was presided by Dr. B. P. Adhikari, Chairman, Q R T.

16.6 Meetings of Heads of Divisions and Sr. Scientists

During the quarter under report the following meetings were held:

i)	HDS and Sr. Scientists	on	8-2 83
ii)	— do —	on	8-3-83
iii)	— do —	on	24-3-83
iv)	— do —	on	30-3-83

16 7 IASRI Representatives at the meetings of Scientific Panel of ICAR :

Name of the Officer	Name of the Scientific Panel & Date
1. Sh. P N. Bhargava Sh. H.C. Jain	"Agronomy", held on 28th Feb., 1983 and 1st March, 1983
2. Sh. H. C. Jain	"Plant Physiology and Bio-Chemistry," held on 25th & 26th March, 1983.
3. Sh. P. K. Malhotra	"Plant Breeding", held on 4th & 5th March, 1983.
4. Sh. G. N. Bahuguna	"Entomology/Nematology", held on 22nd to 24th March, 1983.

16.8 Other Information :

16.8.1 Dr. Prem Narain was appointed by ICAR vide letter No.7-58/81-EE-II dated 21-2-83 to act as an Expert Member of the Committee constituted by the Government of India, Ministry of Agriculture (Department of Agriculture and Cooperation), Fertilizer & Accounts Wing, to evaluate the proposal submitted by the Economics and Marketing Research Department of Projects and Development India Ltd. for undertaking a study on "Impact of Price Changes on the Growth of Fertilizer consumption in India".

Dr. Prem Narain also attended, as Chairman, the second meeting of sampling methods for food products and Agricultural Inputs Sectional Committee, AFDC:57 to study ISO documents on sampling of food products and Agricultural Inputs, AFDC: 57/P-1, held at Indian Standards Institution, New Delhi on 22nd March, 1983.

16.8.2 Dr. S.K. Raheja was nominated member of Task force for Study to identify Constraints in wheat production', set up by IARI/IASRI, New Delhi.

16.8.3 Dr. A.K. Nigam was appointed as a member of the Editorial Board of the Journal of Indian Society of Agricultural Statistics.

16.8.4 Sh S.C. Rai accompanied the students sports team of the Institute to NDRI, Karnal to participate in III ICAR Inter-Institutional Students Sports Meet held from 2nd March to 5th March, 1983.

16.8.5 The following Scientists were deputed by the Institute for attending XI Orientation Course on Agricultural Research Management being conducted by National Academy of Agricultural Research Management, Rajendra Nagar, Hyderabad (A.P.) from 9th Feb. to 16th March, 1983.

(i) Sh. R.K. Ghai, Scientist (S-1)
(ii) Sh. H B. Choudhry, Scientist (S-1)
(iii) Sh. P.K. Batra, Scientist (S-1)
(iv) Sh. S.N. Arya, Scientist (S-1)

17. व्यावसायिक कुक्कुट फार्मों पर कुक्कुट व अण्डों के उत्पादन सम्बन्धी रखरखाव में श्रमिकों का सदुपयोग ।

चौथी योजना की अवधि के दौरान पंजाव के होशियारपुर जिले तथा दिल्ली राज्य में व्यावसायिक फार्मों पर कुक्कुट व अण्डों की उत्पादन लागत का अनुमान लगाने के लिए, भारतीय कृषि साँख्यिकीय अनुसंधान संस्थान ने दो मार्गदर्शी सर्वेक्षण किये। इन सर्वेक्षणों में एकत्रित किये गये गौण आंकड़ों का उपयोग करते हुए, कुक्कुट पालन में श्रमिक उपयोग पर विस्तृत अध्ययन किया गया था। इस अध्ययन से श्रमिकों के वितरण की पद्धति पर उत्पादकता एवं श्रम-लागत के बीच सम्बन्ध पर तथा उपलब्ध श्रम के उचित माध्यम से श्रम उपयोग सम्बन्धी मानदण्डों पर भी सूचना प्राप्त हुई। विशिष्ट परिणामों में से कुछ पर निम्नलिखित अनुच्छेदों में चर्चा की गई है :-

पंजाव के 119 फार्मों के व दिल्ली के 101 फार्मों के पूरे एक वर्ष के आंकड़े उपयोग में लाये गये थे। पंजाब में 103 फार्मों में केवल पारिवारिक श्रम (प्रथम प्रकार) केवल 2 में अदायगी श्रम (द्वितीय प्रकार) तथा 14 में दोनों प्रकार के अदायगी एंव पारिवारिक श्रम (तृतीय प्रकार) का प्रयोग होता था जबकि दिल्ली में ये आकंड़े क्रमशः 43,24 तथा 34 थे। जिन फार्मों में केवल पारिवारिक श्रम का प्रयोग होता था वहां पंजाब में व्यस्क पुरुष कर्मियों के 11 प्रतिशत, महिला कर्मियों के 1 प्रतिशत, दिल्ली में पुरुष का 17 प्रतिशत तथा महिलाओं के 16 प्रतिशत का मुख्य व्यवसाय कुक्कुट पालन था। पंजाब में लगभग 40 प्रतिशत पुरुषों व 36 प्रतिशत महिलाओं का तथा दिल्ली में 36 प्रतिशत पुरुषों व 30 प्रतिशत महिलाओं का कुक्कुट पालन उनके सहायक व्यवसाय की तरह था।

कुल उपलब्ध पारिवारिक श्रम में से, 44 प्रतिशत पुरुष व 25 प्रतिशत महिलाएं पंजाब में तथा 50 प्रतिशत पुरुष व 33 प्रतिशत महिलाएं दिल्ली में कुक्कुट पालन के धंधे में लगे थे। पंजाब में कुल श्रम में से, लगभग 71.1 प्रतिशत श्रमिक पुरुष, 26.6 प्रतिशत महिलाएं तथा 17 प्रतिशत बच्चे थे जबकि दिल्ली में कुल श्रम में से, लगभग 82 प्रतिशत श्रमिक पुरुष तथा बाकी महिलाएं थीं। सभी प्रकार के फार्मों में महिलाओं की अपेक्षा पुरुष श्रम का उपयोग अधिक विस्तृत था। प्रत्येक मौसम में श्रम का उपयोग लगभग समान क्रम का था।

अण्डे उत्पादन व श्रम लागत के बीच सहसम्बन्ध गुणांक पंजाब में 0.68 व दिल्ली में 0.86 था। अण्डे उत्पादन को आश्रित चर के रुप में तथा श्रम उत्पादन को स्वतन्त्र चर के रुप में लेने से यह देखा गया कि केवल पारिवारिक श्रम व केवल भुगतान श्रम द्वारा संचालित फार्मों के विषय में कोबडगलस फलन के फलस्वरुप भिन्नता का अधिकतम प्रतिशत रहा।

श्रम प्रयोग का मानदण्ड निकालने के लिए प्रत्येक वर्ग की मुर्गियों द्वारा खाए जाने वाले चारे के आधार पर विभिन्न वर्ग की मुर्गियों को एक मानक मुर्गी अर्थात 'लेयर' में परिवर्तित कर दिया गया था। पंजाब में 1.00: 0.33: 0.62: 0.76: 0.83: 1.04: 0.98 अनुपातों की सहायता से तथा दिल्ली में 1.00: 0 9: 0 40: 0 65: 0.75: 0.84: 1.04 अनुपातों की सहायता से किया गया था जो कि क्रमशः 8 सप्ताह तक की आयु वाली मुर्गियों, 8-12 सप्ताह की आयु वर्ग वाली युवा मुर्गियों, 12-16 सप्ताह वर्ग की, 16-20 सप्ताह की तथा 20-24 सप्ताह की आयु वर्ग की मुर्गियों तथा व्यस्क मुर्गों के साथ प्रदायक रुप में होता है। इसी प्रकार से एक पुरुष द्वारा लगाया गया श्रम मानक श्रम के रुप में लिया गया तथा एक महिला व बच्चे द्वारा लगाया गया श्रम मजदूरी दर के आधार पर इस स्तर में परिवर्तित कर दिया गया। पुरुष, महिलाओं व बच्चों के श्रम की मजदूरी दरों के अनुपात पंजाब में 1.' 0: 0.२5: 0.75 और दिल्ली में 1.00: 0.84: 0.71 थे। उन फार्मों के समूह को ध्यान में रखते हुए जहां पर मुर्गी की उत्पादकता दर समस्त औसत की अपेक्षा अधिक थी, यह पाया गया कि पंजाब व दिल्ली में केवल पारिवारिक श्रम का प्रयोग करने वाले फार्मों पर प्रत्येक मानक मुर्गी पर प्रति दिन अपेक्षित समय लगभग एक मिनट का था और क्रमशः लगभग 0.8 मिनट व 0.7 मिनट उन फार्मों पर था जिनमें केवल भुगतान श्रम और पारिवारिक एंव भुगतान श्रम दोनों का ही दिल्ली में उपयोग होता है। अब विभिन्न वर्ग की मुर्गियों के मानकीकरण के लिए प्रयुक्त अनुपातों का उपयोग करके अन्य वर्गों की मुर्गियों के रखरखाव के लिए अपेक्षित समय प्राप्त किया जा सकता है।

अनुवादिका : कु० उषा कंसल निरीक्षक : सर्व श्री महाराज स्वरुप एंव फणीन्द्र पाल सिंह

18. माधावरम दुग्ध संभरण योजना चिंगलपुट तमिल नाडू के दुग्ध एकत्रित करने वाले क्षेत्रों में ग्रामीण अर्थ व्यवस्था पर दुग्ध संभरण योजनाओं का समाघात ।

डेयरी उद्योग विशेषज्ञों के आग्रह पर भारतीय कृषि सांख्यिकीय अनुसंधान संस्थान, नई दिल्ली द्वारा ग्रामीण अर्थव्यवस्था पर शहरी दुग्ध संभरण योजनाओं के समाघात का मूल्यांकन करने हेतु सांख्यिकीय पद्वति विकसित की गई। पहले पहल दिल्ली दुग्ध योजना (D M. S) (1966-67 और 1972-73) और दूध सागर डेयरी, महसाना (D. S D) (1967-69 और 197. -74) के दूध वाले क्षेत्रों में दो विभिन्न अवसरों पर सर्वेक्षण किये गये इन सर्वेक्षणों के आधार पर दूध एकत्रित करने वाले क्षेत्रों में, ग्रामीण अर्थव्यवस्था पर दुग्ध संभरण योजनाओं के समाघात का मूल्यांकन करने के लिए एक उपयुक्त प्रतिचयन प्रणाली (Sampling methodology) विकसित की गयी। उसके बाद दो और केन्द्रों अर्थात् माधावरम दुग्ध संभरण योजना (M.M.S) तमिलनाडू (1975-76 और

1979-80) और वृहद् कलकत्ता दुग्ध सभरण योजना, पश्चिमी बंगाल (1976-77 और 1980-81) के दूध उत्पन्न करने वाले क्षेत्रों में विकसित पद्धति का परीक्षण करने के उद्देश्य से सर्वेक्षण किये गये। उप-समिष्टियों (Sub-populations) के प्रभुत्व में आंशिक परिवर्तन के कारण पहली पद्धति में संशोधन किया गया और दुग्ध संभरण योजनाओं के समाधात का मूल्यांकन करने के लिए वर्तमान अन्वेषण में एक नवीन सांख्यिकीय पहुँच विकसित की गयी। यहाँ माधावरम दुग्ध संभरण योजना चिंगलपुट, तमिलनाडू के दूध वाले क्षेत्रों में किए गये अध्ययनों के महत्वपूर्ण परिणामों का संक्षेप में विवरण दिया गया है।

दोनों ही अवसरों पर इन सर्वेक्षणों के आधीन आंकड़े एकत्रित करने के लिए "स्तरित-द्विस्तरीय प्रतिचयन प्रणाली" (Two stage stratified sampling) अपनाई गयी, जिसमें गांवों के गुच्छ (cluster) का प्रथम स्तरीय एकक (Primary stage units) के रुप में तथा एक गुच्छ में स्थित परिवारों को द्वितीय स्तरीय एकक Secondary stage units) के रुप में लिया गया। गाँवों के गुच्छ कों चयन से पूर्व दो भागों में वर्गीकृत किया गया) संभरण क्षेत्र - संगठित दुग्ध संभरण योजनाओं को दूध की आपूर्ति करने वाले गांव और (II) गैर संभरण क्षेत्र (नियंत्रित गांव) जहां से किसी संगठित योजना को दूध नहीं भेजा जाता था, परन्तु वे कृषि एवम् जीवविज्ञान की दृष्टि से संभरण क्षेत्र के समान थे।

दूसरे अवसर पर की गई पूछताछ के समय प्रथम अवसर पर चयनित दोनों स्तरों की इकाइयों को ही प्रयुक्त किया गया। इस स्थिति में समिष्ट को गांवों के गुच्छों से बनी चार उप-समिष्टियों में विभक्त किया गया जो इस प्रकार हैं (I) दोनों ही अवसरों पर संभरण (II) प्रथम अवसर पर संभरण तथा दूसरे अवसर पर गैर-संभरण (III) प्रथम अवसर पर गैर-संभरण तथा दूसरे अवसर पर सभरण तथा (IV) दोनों ही अवसरों पर गैर-संभरण। दिल्ली दुग्ध योजना और दूध सागर डेयरी महसाना के दूध वाले क्षेत्रों में किये गये पहले सर्वेक्षणों में हुए पुनरावर्तन सर्वेक्षण के समय में चारों प्रकार की उप-समिष्टिया पायी गयी। माधावरम दुग्ध संभरण योजना के दूध वाले क्षेत्रों में किये गये वर्तमान सर्वेक्षण में कुछ गुच्छों के स्तर में पूर्ण परिवर्तन और शेष में आंशिक परिवर्तन देखने को मिला। प्रथम स्तरीय एककों के वर्ग में पूर्ण/आंशिक परिवर्तन के परिणाम स्वरुप पुनरावर्तन सर्वेक्षण के समय दिल्ली दुग्ध योजना तथा दूध सागर डेयरी महसाना में की गई चार-उप-समिष्टियों की जगह आठ उप-समिष्टिया निर्मित हुई।

इस अध्ययन में ग्रामीण अर्थ व्यवस्था पर माधावरम दुग्ध संभरण योजना के समाधात का मूल्यांकन करने के लिए वर्तमान अन्वेषणों से विकसित नवीन सांख्यिकीय पहुँच के साथ-साथ चार-उप समिष्टियों के आधार पर इन्ही के समरुप विभिन्न अनुक्रिया सूचकों के आकलन तैयार किये गये।

वर्तमान अन्वेषणों में 5 कि० मी० की परिधि के अन्दर-अन्दर 3 गांवों के 60 गुच्छे जिनमें से 35 संभरण क्षेत्र से और 25 गैर-संभरण क्षेत्र से बिना प्रतिस्थापित (without replacement)

किये यादृच्छिकत: (randomly) चुने गये । संभरण तथा गैर-संभरण क्षेत्र के समूहों का, उनके द्वारा दूध परियोजना को भेजे गये दूध की मात्रा के आधार पर मंडलीय (stratum wise वर्गीकरण किया गया। विभिन्न प्रकार के 23 परिवारों में सुसंगत सूचनाएं एकत्रित करने के लिए चार सप्ताह के अन्तराल पर सम्पर्क किया गया। क्षेत्रीय काय 16 माह तक चला। इस सर्वेक्षण के कुछ महत्वपूर्ण परिणाम नीचे दिये गये हैं।

दूध पर अध्ययन :

प्रथम सर्वेक्षण के सापेक्ष पुनरावर्तन सर्वेक्षण के निर्देश चिन्ह के समय डेयरी के लिए दूध की वार्षिक आपूर्ति में 3.5 लाख टन से 6.4 लाख टन तक की पर्याप्त वृद्धि हुई। इसलिए इससे यह संकेत मिलते हैं कि माधावरम दुग्ध संभरण योजना दूध वाले ग्रामीण क्षेत्रों से अधिक से अधिक दूध प्राप्त करने में काफी सफल रही। पहले अवसर पर 70 प्रतिशत और दूसरे अवसर पर लगभग 80 प्रतिशत व्यावसायिक दुग्ध उत्पादकों ने माधावरम दुग्ध संभरण योजना, आइनावरम दुग्ध संभरण योजना इत्यादि जैसे संगठित संस्थाओं को अपने दूध की आपूर्ति की और साथ ही साथ पहले अवसर पर किये गये सर्वेक्षणों की अपेक्षा दूसरे अवसर पर किये गये सर्वेक्षण में यह भी देखा गया कि प्रति परिवार दुधारु पशुओं की औसत संख्या में वृद्धि हुई । संबद्ध क्षेत्र में 96 प्रतिशत से ऊपर पाये गये दुधारु पशु अज्ञात वंशी थे । दूसरे अवसर पर पहले अवसर की अपेक्षा दैनिक दुग्ध उत्पादन में 77 टन से 91 टन तक की वृद्धि हुई। कुल दैनिक दुग्ध उत्पादन के सम्बन्ध में सभी आठों उप-समिष्टियों के आधार पर समाधात के आकलनों से देखा गया कि गाय के दूध में लगभग 9 प्रतिशत की और भैंस के दूध में लगभग 7 प्रतिशत की वृद्धि हुई।

चारे पर अध्ययन :

दूसरे अवसर पर किये गये सर्वेक्षण में देखा गया कि दूध देते हुए पशुओं को खिलाये गये कुल चारे में, प्रथम अवसर पर किए सर्वेक्षण के समय की अपेक्षा पर्याप्त वृद्धि हुई। दूसरे अवसर पर संभरण क्षेत्र में प्रत्येक दूध देती हुई गाय के प्रतिदिन खिलाये गये औसत चारे में प्रथम अवसर की अपेक्षा 8.0 कि० ग्रा० से 8.4 कि० ग्रा० तक की वृद्धि हुई। इसी प्रकार भैंसों के मामले में 9 2 कि० ग्रा० से 9 8 कि० ग्रा० तक की वृद्धि हुई। गैर-संभरण क्षेत्र में वृद्धि अपेक्षाकृत अधिक सुस्पष्ट थी। हरे चारे का प्रमुख घटक साधारण घास (लगभग 90 प्रतिशत से अधिक) थी। सूखे चारे में धान का भूसा प्रमुख घटक (लगभग 90 प्रतिशत से अधिक) था जबकि सांद्र चारे में चावल की चोकर प्रमुख घटक (लगभग 90 प्रतिशत से अधिक) थी ।

फसलों पर अध्ययन :

इस क्षेत्र में प्रमुख खाद्य एवम् व्यापारिक फसलें धान, मूँगफली, रागी और चोलम थी। दूसरे अवसर पर पहले अवसर की अपेक्षा धान उगाने वाले कृषकों का प्रतिशत 74 से बढ़कर 95 हो गया। गैर-व्यावसायिक परिवारों में दूसरे अवसर पर व्यावसायिक परिवारों की तुलना में खेती करने की

तीव्रता (intensity of cropping) में विचारणीय वृद्धि हुई।

रोजगार पद्धति पर अध्ययन :

दोनों ही अवसरों पर संभरण क्षेत्रों में सभी प्रकार के कृषक परिवारों में औसत परिवार आकार 5 से 6 के बीच था । जबकि गैर कृषक परिवारों का आकार लगभग 4 था। प्रत्येक अवसर पर साक्षरता स्तर गैर-व्यवसायिक दुग्ध उत्पादकों के बीच उच्चतम और दूध का उत्पादन न करने वालों में निम्नतम था। सभी प्रकार के कृषक परिवारों में पहली बार के सर्वेक्षण के समय लगभग 69 तथा 63 प्रतिशत खेती, 11 तथा 16 प्रतिशत क्षेत्रीय कार्य, 6 तथा 9 प्रतिशत नौकरी, 2 तथा 1 प्रतिशत दुग्ध उत्पादन तथा शेष अन्य व्यवसायों में क्रमशः संभरण तथा गैर संभरण क्षेत्र में कार्यरत थे। दूसरी बार किये सर्वेक्षण के समय यह आँकड़े क्रमशः 46 तथा 66 प्रतिशत, 11 तथा 12 प्रतिशत, 10 तथा 5 प्रतिशत, 9 तथा 3 प्रतिशत एवम् शेष अन्य व्यवसायों में कार्यरत थे। दुग्ध उत्पादन में कार्यरत कामगार दूसरे अवसर पर बढ़ गये।

आय पर अध्ययन :

संभरण क्षेत्र में सभी प्रकार के परिवारों को वार्षिक नकद आय दूसरे अवसर पर पहले अवसर की अपेक्षा 2585 रु० से बढ़कर 2629 रु० तथा गैर-संभरण क्षेत्र में 2989 रु० से बढ़कर 3660 रु० हो गई । सभी प्रकार के परिवारों की कुल वार्षिक आय में दूसरे अवसर पर बहुत कम वृद्धि हुई। जैसे संभरण क्षेत्र में 3574 रु० से बढ़कर 3654 रु० तथा गैर-संभरण क्षेत्र में 3757 रु० से बढ़कर 4640 रु० हो गई। योजना के समाधात से यह देखा गया कि डेयरी उद्योग में प्राप्त आय में 13 प्रतिशत की वृद्धि हो गई ।

कुछ सहायक विषयों पर अध्ययन :

इस क्षेत्र में दूसरे अवसर पर दुग्ध सहकारी संगठनों की संख्या में बहुत तेजी से गिरावट आयी। अधिकतर संगठन दुग्ध उत्पादक को उसका मूल्य दूध में स्थित वसा की मात्रा के आधार पर मासिक अन्तराल से देते थे । दूसरे अवसर पर पहले की अपेक्षा सहकारी संगठन में लगाई पूंजी का औसत भाग 5605 रु० से बढ़कर 6375 रु० हो गया । दोनों अवसरों पर इस क्षेत्र में दूध के दलालों (दुधिया) की एक अच्छी खासी संख्या पायी गयी। औसतन एक दूधिया लगभग 56 परिवारों से प्रथम अवसर पर तथा 40 परिवारों से दूसरे अवसर पर दूध एकत्रित करता था। ये दूधिया सामान्यतः दूध को हलवाई, क्रीमरी, होटल तथा व्यक्तिगत उपभोक्ताओं को वितरित करते थे।

अधिकतर परिवारों में चारा पशुओं को अलग-अलग खिलाने की अपेक्षा झुण्डों में दिन में दो बार खिलाया जाता था। यह चारा सूखा तथा तर दोनों ही रुप में दिया जाता था। लगभग सभी परिवार अपने पशुओं को लगभग 7 घण्टों तक चरने के लिए भेजा करते थे। गैर-खेतीहर परिवार भी बिना कीमत चुकाये ही हरा चारा प्राप्त कर लेते थे।

लगभग 75 प्रतिशत परिवार अपने पशुओं को अलग मकान में रखते थे । पशुओं को सामान्यत: उनके मकानों की जगह एक सार्वजनिक दुग्ध गृह (घेर) पर दुहा जाता था ।

दूसरे अवसर पर पशु चिकित्सा सुविधा का उपयोग करने वाले परिवारों में एक अच्छी खासी उन्नति हुई । जहाँ तक कृत्रिम गर्भाधान की बात थी, यह देखा गया कि इस सुविधा का उपयोग करने वाले परिवारों की संख्या में 11 से 19 प्रतिशत तक की वृद्धि हुई । प्राकृतिक गर्भाधान में प्रयुक्त उन्नत सांड का उपयोग करने वाले परिवारों की प्रतिशत में भी दूसरे अवसर पर विचारणीय वृद्धि हुई ।

उपयुक्त अध्ययन से यह परिणाम निकला कि इस क्षेत्र की आर्थिक स्थिति सुधारने में डेयरी उद्योग एक महत्वपूर्ण साधक का कार्य करती है ।

19. संस्थान में हिन्दी के बढ़ते कदम

गत त्रैमास जनवरी-मार्च, 1983 में इस संस्थान में हिन्दी में पर्याप्त प्रगति हुई है, कभी-कभी ऐसा महसूस होता हैं कि राजभाषा की प्रगति जिस गति से होनी चाहिए उस गति से नहीं हो रही है । विभिन्न अनुभागों द्वारा हिन्दी परिपत्र, ज्ञापन इत्यादि निकाले तो जाते हैं लेकिन सीमित संख्या में । इनकी संख्या और अधिक बढ़ाने हेतु अनुरोध किया गया । हिन्दी निरीक्षण समिति ने प्रशासनिक अधिकारियों से यह भी अनुरोध किया कि समस्त परिपत्र, ज्ञापन इत्यादि द्विभाषी रुप में ही निकाले जायें । इस तिमाही की सबसे बड़ी उपलब्धि यह रही कि इस दौरान संस्थान में हिन्दी अधिकारी के पद को भरने के लिए साक्षात्कार लिया गया, और चयनित अभ्यार्थी को कार्यभार ग्रहण करने हेतु नियुक्ति का प्रस्ताव भेजा जा चुका है । आशा है कि शीध्र ही हिन्दी अधिकारी संस्थान में कार्यभार ग्रहण कर लेंगें ।

गत तिमाही में ऐसा भीं देखने में आया कि कुछ अनुभागों ने हिन्दी के उपयोग के प्रति उपेक्षा की दृष्टि अपनाई और व्यक्यिों द्वारा मांगने पर भी हिन्दी में ज्ञापन इत्यादि नहीं दिये गये । इस पर हिन्दी एकक के कर्मचारियों ने तुरन्त कार्यवाही कर संस्थान के निदेशक महोदय से सम्पर्क स्थापित किया । निदेशक महोदय ने संबद्ध अनुभागों को आवश्यक अनुदेश दिये और हिन्दी एकक को आश्वासन दिया कि इस प्रकार को ढ़ील आगे से कभी नहीं बरती जाएगी । इसके अतिरिक्त गत तिमाही रिपोर्ट का संकलन कार्य चल रहा है और शीध्र ही संकलित कर ली जाएगी । इसी प्रकार राजभाषा कार्यान्वयन समिति की तिमाही बैठक को शीध्र ही आयोजित करने के प्रयास किये जा रहे हैं ।

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Printed at : Chinar Printers, Yogi Service Station Compound. Hari Singh Park, New Multan Nagar, Rohtak Road, New Delhi-110056.