REVIEW OF LITERATURE
Various Agro-Industrial byproducts were tried by numerous workers all over the world to suit the requirements of different classes of animals.

**Brewers dried yeast and grain**

In Europe and America Brewers dried yeast and grains and Bakery waste were reported to be used as feed for livestock and poultry and was considered to be a good supplement in Poultry Rations (Morrison 1954). MATTISON et al (1966) tried corn distillers dried grains and solubles in the ration of producing hens. HARMS et al (1969) evaluated distillers dried grains with solubles in the diet of laying hens and concluded that distillers dried grains and solubles (DDGS) could be used up to 10% level replacing cereals without any harmful effect. DIXON et al (1970) pointed that distillers dried solubles as a source of unidentified growth factor by using them on turkeys, quails and chicks. LAURENT et al (1971) tried brewers dried grains and rumen contents for laying hens without any difference in egg production, consumption and weight gain. HASHIMOTO et al (1971) continued the digestion experiment on dairy cows with brewers dried grains and reported its nutritional standards. GRIFFITHS (1971) also conducted digestibility trials with brewers grains on dairy cows and reported its nutritional bias. HATCH et al (1972) utilised Brewers dried grains with yeast on bullocks for growth, efficiency and carcass quality without any significant difference. BRANCKAERT et al (1972) fed Brewer's grains to pigs with satisfactory result on growth and carcass
quality. Caldwell (1972) tried dried distillers' yeast for feeding pigs and reported greater efficiency by 20% supplementation over conventional feed ingredients. El-Hag & Millar (1972) reported the efficiency of whisky distillers' grains as evidenced by weight gain in sheep, with the addition of calcium. Waldrop et al. (1971) tried corn dried steep liquor concentrate for laying hens and Selim et al. (1972) tried byproducts of corn and cereals replacing maize in different proportions in poultry feed with favourable findings. Reveron et al. (1971) tried whisky distillery products on lambs for their liveweight gain with encouraging results. Wegner (1973) tried brewers' grain for fattening chickens without any significant difference on their weight gain. Presion et al. (1973) studied the energy evaluation of brewers' grains on growing and finishing cattle with encouraging results and concluded that, brewers' grains had a beneficial effect on the rumen wall and reduced the incidence of liver abscesses. Kornegay (1973) evaluated the metabolizable energy and protein utilisation value of brewers' grain on swine and concluded that protein utilisation was better with the addition of yeast.

Adeosun (1973) reported the nutritional standards of Brewer's dried grains and its use on growing chickens with encouraging results. Vogt (1973) tried 'DDGS' for fattening chickens, while Goto et al. (1974) studied its effect on laying hens with promising results. DCSD et al. (1974) fed brewer's yeast broth to rats and concluded that although there were no adverse effect on health but high intake impaired results.

Citrus seed and Citrus seed meal:

Citrus seeds and citrus seed meal, were tried with different classes of poultry by MEHRCHOF et al (1938 & 1939), WHITSON et al (1944), DRYGERS et al (1949) with variable results. DEYDE et al (1962) tried citrus bioflavonoids in broiler diets at 2.5% level but inclusion at 5% level resulted marked reduction in the growth of broilers. RODRIGUEZ (1971) tried dehydrated citrus pulp on milking cows up to 45% level with adverse effect on milk production. SHULTZ et al (1971) tried citrus pulp for fattening Cattle without any significant difference. RODRIGUEZ (1972) further tried dehydrated citrus pulp replacing cereals on cows and concluded that there was no significant difference on composition of milk production and feed intake. CHAPMAN et al (1972) tried citrus pulp for beef Cattle with encouraging results. CARMEVALI et al (1972) tried citrus pulp for fattening cattle without any appreciable adverse effects on carcass conversion. DEVENDRA (1973) estimated the digestibility of a diet containing Citrus meal on sheep but concluded that further investigation towards its efficacy has to be ascertained.

BATRD et al (1974) undertaken a series of experiments with dried citrus pulp on pigs at 10,20 & 40% levels replacing maize with favourable results.
BHATTACHERYA et al. (1973) replaced grain by citrus pulp in the feed for Awasi lambs with encouraging results. CHISSCO et al. (1974) tried citrus pulp for fattening lambs with variable results. RODRIGUEZ et al. (1974) tried citrus pulp on calves to record their performance without any significant difference on fattening them. ECONOMIDES et al. (1974) conducted digestibility trial on citrus pulp, vine cane and acacia leaves with different classes of poultry with variable results. VELLOSO et al. (1974) tried pelleted and milled citrus pulp on laying hens at 10% level without any significant difference in production.

tomato waste, apple waste, orange pulp etc.: 

MORRISON (1954) cited the utilisation of tomato waste, apple waste and orange pulp on cattle and swine with encouraging results. KWEE et al. (1971) evaluated tomato cannery waste and vine towards their functional and nutritional value and recommended its use as animal feed. VOYST et al. (1971) tried vinase (a by product of citric acid production) on growing cattle with encouraging results. SANCHEZ et al. (1971) analysed and reported the nutritional values of the residues of orange, tomato and garden pea on dry matter basis. PATEL et al. (1971) tried tomato waste on lactating cows without any significant difference on milk production. KAVAMOTO et al. (1970 & 1971) tried dried tomato waste for growing and finishing rabbits with discouraging results. KRONKA et al. (1970 & 1971) utilised tomato industry byproduct for growing and finishing pigs and recorded significantly poor result. Apple waste, prepared from peelings
peelings, cores and culls, pressed with rice husks were tried successfully by WILSON et al. (1971) for fattening livestock. FARTA et al. (1972) prepared silage with fresh and dried orange pulp for animal feeding but further results on this work was not reported. SCOTTI et al. (1973) detailed the chemical analysis of dried orange pulp and conducted feeding trials on sheep with encouraging results. SANCHEZ et al. (1971) conducted the bio-chemical study with lemon by-product and fed sheep for fattening with encouraging results. AGAABYAN et al. (1974) detailed the chemical composition of apple waste and Grape pumace derived from pressed sweet grapes, utilised for the biosynthesis of fodder protein. IVONOVA et al. (1973) tried grape pumace for fattening livestock with encouraging results.

**Rumen content and Rumen Liquor:**

HAmMOMD (1944) tried dried rumen contents as a partial substitute of Alfalfa leaf meal in poultry rations with favourable findings. COET et al. (1972) replaced skim milk with dried rumen liquor to buffalo calves to study the growth rate and blood constituents without any significant difference.

**Coffee husk and meal:**

Dried coffee grounds were tried by HAMMOND (1944) in poultry feed. PUTTRACQ et al. (1970) tried coffee bean pulp with molasses in the diet of growing and finishing pigs without any significant difference towards feed intake and weight gain. LEDGER et al. (1972) replaced maize with 10, 20 and 30% coffee husks in cattle fattening rations, and concluded that feed intake, body weight gain and feed
and concluded that feed intake, body weight gain and feed conversion were unaffected by 10 or 20% replacement but replacement of 30% reduced them significantly. PRESSAM et al (1972) detailed the chemical composition and mineral content of coffee husk and pulp. JARQUIN et al (1973) replaced cotton seed husk with coffee pulp and husk on calves and opined that their body weights were unaffected. PRAMAM et al (1973) fed coffee pulp as silage for fallen calves with discouraging results. PRESSAM et al (1973) utilised coffee pulp and husks in the poultry feed with discouraging results. DROK et al (1974) supplemented cocoa husks and cassava meal for maize on rats and concluded that, cassava meal may be substituted at 30% to 50% level. CAREZAS et al (1974) tried coffee pulp replacing cotton seed hulls on cattle and concluded that feed intake decreased as coffee pulp increased in the diet. JARQUIN et al (1974) tried coffee husks for fattening cattle with discouraging results. FORMAROLY et al (1974) tried expanded coffee for feeding livestock as an ingredient of fattening ration with variable results.

Kitchen waste and garbage:

During the second world war poultry feeding became a serious problem in Europe and DUDLEY et al (1942), HUNT et al (1942), TEMPERTON et al (1943, 1944, 1945, 1946) carried out extensive research trials with kitchen waste and town waste as poultry feed. WRIGHT & DUDLEY (1944 & 1945) tried processed garbage as feed for different
classes of poultry due to acute shortage of conventional feed ingredients but further references towards establishment of its efficacy are not available. Morrison (1954) reported convincing results on feeding town waste and garbage to pigs replacing cereals. Morrison (1954) reported convincing results on feeding town waste and garbage to pigs replacing cereals.*

Processed cowdung and poultry manure:

Hammond (1942 & 1944) reported feeding of processed cowdung to different classes of poultry with encouraging results. Chillar et al. (1972) tried sundried cowdung replacing maize partially and hatchery waste in the replacement of ground nut cake partially without any significant difference in production. Cregger et al. (1973) tried broiler litter silage for fattening beef animals with encouraging results.* Rao and Sadagopan (1975) detailed a vivid report of I.V.R.T. laboratory on alternate feeds for poultry and trials with sal seedmeal, poultry manure, sunflower seed meal, damaged feed grains and hatchery by-product meal with variable results at different proportion of inclusions. Panda et al. (1976) carried out extensive feeding trials with autoclaved and dried poultry manure at different levels of poultry feeding at I.V.R.T. with encouraging results.

Potato waste and by-product:

Milam & Dudley (1941) tried potato meal on growing chickens, Wright & Dudley (1944) tried steamed potatoes on laying hens with encouraging results.* Wegner et al. (1963)
WEGNER et al. (1963) replaced maize with sugar in the diet of chicks and growers with encouraging results. DICKEY et al. (1971) utilised dried potato by-product meal on cows, sheep and heifers without any significant difference on milk productions, composition of milk and bodyweight gain. CONARA et al. (1971) tried byproduct of potato of starch production on cows with encouraging results. HETEMANN et al. (1972) fed potato slurry to bullocks with encouraging results. DUKSTRA (1971) reported that concentrated effluent from the potato floor industry pelleted with potato pulp and fed to cattle with greater feeding value. OCEOVE et al. (1973) pressed and dried potato pulp to form meal and attributed that the digestion of energy increased significantly with pigs. KOD et al. (1974) tried sweet potato pulp to pigs for fattening with encouraging results. HORICOME et al. (1972), KOC et al. (1972) tried sweet potato pulp to different classes of poultry for fattening and production with encouraging results. HASHIZUME et al. (1974) fed wet potato pulp and dried beet pulp in the cattle feed without any adverse effect on health, blood and urine of cows. IGRAMOLA (1974) used starch industry by products in the feed of different animals with encouraging results.

Cotton seed meal:

BUITRAFO et al. (1970) tried cottonseed meal in rations for growing and finishing pigs with discouraging results. MONCADA et al. (1970) reported its use successfully on pigs and neutralisation of its toxic effects has been
has been achieved by the addition of ferrous sulphate. LAMGLANDS (1970) supplemented with cottonseed meal and formaldehyde treated cottonseed meal on sheep for wool production and liveweight gain with disappointing results. AKMAL'KHANOV et al (1970) tried cottonseed cake on the milk production and fat content of Swiss Cows with promising results. RASHIDOVA et al (1972) reported the use of cottonseed feed on sheep and reported that Nitrogen C and P are better utilised with the addition of antibiotics. KORNESEY et al (1972) tried fungal treated cottonseed meal on swine with variable results. Cottonseed meal was tried as a partial replacement of fish meal by EL-FAHAM (1972) on poultry and judged their production, fertility and hatchability. ARMA et al (1972) reported evaluation of cotton seed meal and tried on broilers with successful results. PEREZ-PURTEL et al (1973) reported further advances on the application of cottonseed meal in poultry feed. UTTEEY et al (1973) fed cottonseed meal and biuret mixtures for fattening cattle during winter, wherein cows lost 0.26 to 0.43 lb. liveweight daily but the calves gained 1.21 to 1.38 lb daily. RASHIDOVA et al (1972) tried fattening cattle with cottonseed residues but discontinued the experiment as 17 out of 20 cows shown gossypol poisoning symptoms. CALVET et al (1973) tried cottonseed for intensive fattening of cattle and reported improved carcass quality. RASHIDOVA et al (1973) tried cottonseed feeds for fattening Karakul sheep with successful results. CHRISTENSEN et al (1973) tried
tried cottonseed meal on Dairy cows without any significant difference in production. MORITSKY et al. (1974) tried cottonseed based diet to sheep with successful results up to 65% replacement. DAVIES (1972) reported utilisation of cotton seed hulls by steers without any significantly different result. RASHIDOV et al. (1972) tried cotton plant residues on cattle without any depressant action.

**Beet pulp and Molasses:**

MORRISON (1954) cited the work of MILLINGS & CONNELL et al. in regard to the utilisation of beet pulp as a suitable supplement for fattening cattle. ZHORITSKH (1971) tried beet pulp for fattening cattle and observed decline of serum, Ca & P and subclinical osteodystrophy. HENKEL (1971) fed sliced beet pulp to pigs replacing barley and the result of 20% replacement was found to be quite promising while 40% replacement, brought about discouraging results. Fermented beet molasses was derived as a by-product of citric acid production and was reported to be used in broilers by GONZALEZ et al. (1971) with encouraging results. KAEMMERER et al. (1972) investigated the tolerance of sheep to high concentrations of sulphate in dry beet pulp and concluded that ruminants can tolerate sulphite content in factory dried beet pulps without any adverse effects. DEPARCE (1972) tried beet pulp on cattle for fattening with encouraging results. SCATLTEUX (1972) reported utilisation of beet pulp for intensive beef production with successful results. SEYDLER et al. (1972)
SEIDLER et al (1972) tried sugar beet molasses replacing barley and dried potatoes on pigs without any significant difference on daily weight gain, efficiency of feed utilisation and carcass quality. CADANTU et al (1972) tried moist beet pulp on dairy cows and recorded significant increase in milk production, without any adverse effect on health, weight gain, and protein utilisation.


Mangoseed Kernal : PATEL et al (1971) investigated the possibility of incorporating mangoseed kernal in cattle feed. The trial on cows and buffalo calves revealed that inclusion at 20% level exhibits no adverse affect on growth, or N, Ca and P balance. PATEL et al (1972) further tried mango seed kernals and tomato waste in the ration of bullocks with similar findings. RAY (1975) tabulated the works conducted on the nutritive value of unconventional feeds started
as early as third decades of this century at the N.D.R.I.
and I.V.R.I. and reports on Mango seed Kernal, tamarind seed, babul pods, mahua flowers and cake, tomato pumace waste, pine apple bran and tapioca spent pulp at different concentration replacing cereals in different classes of animals with variable results.

**Grapeseed meal:** MORRISON (1954) cited the work of FOLGER towards usage of grape pumace on swine replacing cereals but the results were not very encouraging. BAYON (1971) fed grapeseed meal to cattle replacing cereals and the results on milk yield, growth rate, liveweight gain and carcass quality were without any significant difference as compared to cereals at 30 to 50% replacement level. GIRALDA et al (1970) tried grapeseed meal for milk production on ewes with encouraging results. SANCHEZ et al (1971) evaluated the energy value of grape by-products and obtained encouraging results on liveweight gain for sheep. MAZZIOTTI et al (1970) tried solvent extracted grapeseed meal on castrated lambs with encouraging result on bodyweight gain. I&ONOMOVA et al (1973) fed grape residues from wine production industry for fattening pigs with encouraging results. MAVROGENIS et al (1973) fed grape pulp and grape seed meal for fattening lambs with encouraging results.

**Tamarind seed:** AMMENUDDIN et al (1976) replaced a portion of cereals with tamarind seed in the feed of growers and layers with encouraging results.

**Rubber seed meal:** BHUVANENDRAN, (1971) replaced coconut meal by rubber seed meal and reported its efficacy towards
hatchability in laying hens. SIRIWARDANE, (1972), evaluated rubber seed meal, obtained as a by-product of rubber industry and advocated its use in poultry feed.

**Peanut & Peanut meal**: OFFIONG et al (1974) reported the use of raw peanuts and peanut meal in practical broiler feed with convincing results. VILHJALMSDOTTIR et al (1971) tried castor bean meal as a source of protein while SILVIERA et al (1972) reported feeding of velvet beans to chicks without any significant difference on their growth.

**Tapioca pulp or leaf meal**: MORRISON (1954) cited the work of HANKE on the utilisation of casava leaf and meal upon cattle and other livestock with encouraging results. Cassia tora leaf meal at 5% level was successfully tried by MURTHY, (1962) in poultry feed but inclusion at 10% level affected digestibility. ROSS et al (1965) reported depressed growth on feeding cassia tora leaf meal. PILLAI et al (1968) advocated the use of tapioca spent pulp as an ingredient in poultry feed. PATEL et al (1972) tried tomato waste, mango seed kernals and cassia tora seeds on bullocks with positive N, P and Ca balance. GUPTA et al (1971) reported the efficacy of Chakunda (Cassiatorum) leaf meal, pressed by different methods on growing chickens. HEW VOON et al (1972) replaced maize with tapioca roots step-wise to 50% level and the bodyweight gain on pigs were found to be encouraging. ISLABAD et al (1971) tried
cassava leaves for starter diet with discouraging results. MELOTTI (1972) detailed the chemical composition and nutritive value of different by-products of cassava. DIVIDICH et al (1974) detailed the feeding value of banana meal and cassava meal and tried on pigs for fattening with encouraging results.

Sugarcane bagasse: MORRISON (1954) reported the work of KIRK et al on the utilisation of sugarcane bagasse as a part of maintenance ration for livestock with favourable results. Sugarcane bagasse was tried on bullocks by RANDEL (1972) with encouraging results. CHAPMAN et al (1972) tried bagasse pallets as roughage for fattening cattle with encouraging results. JEREJ et al (1972) substituted maize by sugarcane and studied the effect on milk production and composition without any significant difference. BIROLAUD et al (1973) tried to develop animal protein from sugarcane by-products (cane juice and yeast) but further trial reports were not available. MARTIN et al (1974) studied the effect of sodium hydroxide and pressure on the dry matter digestibility of bagasse and bagasse pith using cattle as experimental animal and reported into digestibility with alkali treatment. PIGDEN (1974) fed derinded sugarcane as feed for cows, pigs and lambs for fattening with encouraging results without any digestive disturbances in any of the trials.

Feather waste and Hatchery waste: FULLER (1956) processed poultry by product meal, feather meal and hydrolised
poultry manure and tried on different classes of poultry and found to be as effective as fish meal in the commercial broiler feed, while feather meal exhibited unidentified growth factors. SHIBALD et al (1962) opined feather meal is inferior to meat meal and soybean meal but may be used partially. WISMAN, (1964), ROSS et al (1965) analysed processed hatchery by-product and shown to be an acceptable ingredients in corn-soya broiler type diet. JACKSON (1971 & 1973) replaced soybean meal with feather and offal meal in the poultry feed and tried them with chicks, growers, layers and broilers with convincing results. MULLER et al (1971), BURBOS et al (1972) tried poultry offal and feather meal at different stages of poultry with variable results. BALLDUN et al (1974) indicated further processing of feather meal with whey and yeast to suit the requirement of chickens.

Leather Industry by-product : PRATT et al (1972) tried processed sheepskins as protein supplement to chicks with discouraging results. Glutamic acid fermentation by-product was reported to be used in poultry feed by HIRAKATA et al (1973) with variable results. Feeding value of glue-meal derived as a leather industry by-product for chickens reported by WOLTER (1974) with variable results.

Industrial waste water : HERSTAD et al (1973) reported recovery of protein from industrial waste water and its
Its effect on feeding chickens. NAJMAN et al (1973) isolated 'Biomass' a product of biological purification of waste water after production of cellulose, and reported partial replacement of high quality protein in broiler feed with encouraging results.

**Banana Waste**: MALLESSARD (1971) tried banana waste for feeding pigs, but further references on this problem are not available. DIVIDICH et al (1974) fed dried green banana pulp to piglets and reported improvement in digestibility and growth.

**Cashewnut meal**: PIVA et al (1977) detailed the nutritive value of cashewnut meal and conducted its trial on rate and opined that the protein score of cashewnut meal was better than soybean meal. FETUGA et al (1974) tried cashewnut meal in the diet of pigs without any significant difference in carcass composition.

**Copra meal**: LEBADAN (1969) tried copra meal on ducklings and chickens and experienced discouraging results towards their live weight gain. CRESWELL et al (1971) evaluated composition, apparent digestibility and energy evaluation of cocoanut oil and cocoanut oil meal on pigs with encouraging results. MCINTYRE (1973) supplemented cocoanut meal on dairy cows for milk production with encouraging results. DEVENDRA (1973) studied the comparative digestibility of pork lard and cocoanut oil on sheep and concluded that the digestibility of coconut oil was greater than pork lard.
Pepper byproduct: LOPEZ et al (1972) evaluated pepper byproduct and tried on lambs for fattening with encouraging results at 2 per cent inclusion level but larger proportions reduced intake. TORTUERO (1972) fed pepper residue to laying hens to judge its efficacy on yolk colour with encouraging results. SANCHEZ et al (1972) tried pepper residues for fattening sheep without any significant difference on growth.

Guarmeal: SATHE et al (1962) tried guarmeal for feeding chickens and observed depression in the growth rate and feed efficiency. KWATRA et al (1968) reported the effect of feeding guar meal (cyanopsis Tetragonoloba) while NAGPAL et al (1971) further standardised guarmeal in raw and autocalved form for feeding chickens without any significant difference on weight gain. RAO et al (1976) tried guar meal, muga gram chuni and rice polishings to chicks but no marked difference were observed.

Moorchuni: Lloyd (1964) substituted maize with munga in the broiler diet without any statistical difference in body weight gain and feed conversion. SRIVASTAVA et al (1971) reported the effect of feeding moog chuni (by product of phaschos mungo) as a single concentrate for egg production with discouraging results.

Sawdust: HUDSON (1972) detailed the factors affecting hydrolysed sawdust as a feed for animals, with variable results.
Ricebran: Cereal free poultry feed supplementing cereals with rice polish and ground-nut cake was tried by RATHORE et al. (1971) on growing chickens up to 8 weeks of age with encouraging results. SUBRAMANYAM et al. (1971) tried de-oiled rice bran in chick rations and concluded that deoiled rice bran can safely replace ordinary rice bran (polishing) and could be used profitably up to 35 per cent in chick rations without affecting growth and efficiency.

Carob pod meal: LOUCA et al. (1973) reported the chemical standards of carob pod meal and its use on cattle and goats in different proportions without any significant difference on bodyweight gain. VOHRA et al. (1964) reported the use of ground carob pods replacing cereals in poultry feed with discouraging results but suggested autoclaving of carob-pods and rational use when encouraging results might be obtained.

Oil soapstacks: RENDON et al. (1970) tried groundnut oil soapstacks while CIUDAD et al. (1972) tried acidulated cottonseed soapstacks, and MENGE et al. (1973) tried neutralised soybean oil soapstacks as energy supplement for broilers with encouraging results.

Sisul pulp: FRANK et al. (1973) detailed the nutritional values of sisul pulp and fed for fattening sheep with encouraging results.
Pine apple bran: MORRISON (1954) reported the work of RAIMONDE and HENKEY et al towards utilisation of pine apple bran as a popular dairy feed. OLBRICH et al (1973) fed pine apple bran for fattening cattle with encouraging results.

Salseed extraction: PATEL et al (1972) detailed the nutritive value of solvent extracted sal seed cake and fed bullocks with discouraging results. DASH et al (1972) fed sal seed to cattle replacing rice bran upto 40 percent level with discouraging results. SUKLA et al (1973) studied the effect of feeding salseed to cows and concluded that the effect was better on smaller intake of salseed. KURAR et al (1972) fed sal seed meal to heifers for fattening them with encouraging results. NAGPAL et al (1973) conducted extensive feeding trials with salseed meal on cattle for fattening with encouraging results. PAL et al (1973) tried salseed cake in different proportions on cattle with discouraging results. PATHAK et al (1973) studied the effect of salseed meal replacing maize on pigs, without any significant difference on weightgain. PANDA et al (1975) tried sal seed and sal oil meal as a substitute for cereals in starter mash in different proportions with variable results.

Bakery waste: GREMES (1946) reported that utilisation of bakery waste offers an opportunity to replace grain in swine with favourable results. He further reported that
that bakery waste with low fibre content and high oil content making the material an ideal ingredient for inclusion in the poultry feed. KORNEGAY (1974) reported the use of blended, dried bakery product which consists of discarded cakes, biscuits, bread and unbaked dough from the baking industry. Chemical composition has been analysed and pigs were fed by replacing 12, 24 and 36 per cent of maize with encouraging results.

During the quest of reference on world literature on the problem, Commonwealth Bureau of Nutrition, Aberdeen U.K. (by No.V.1/1 dated 30.11.76) communicated that no reference on the use of biscuit waste to replace cereals in poultry feed is available in their records. (Personal Communication).

Dr. VOHRA, P. Head, Department of Avian Sciences University of California, Davis (personal communication), Head, Department of Animal Science, Punjab Agricultural University (by No.AS/76/JS/17638 dated 24.12.76), PANDA, B. Head, Department of Avian Science, Indian Veterinary Research Institute, Izatnagar (personal communication), Dr. KRUEGER, W.F., Head, Department of Poultry Science Texas A & M University, Texas (personal communications) supported the views of Commonwealth Bureau of Nutrition and informed that, no work has been undertaken on Biscuit waste, replacing cereals in Poultry Feed.