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FORESTRY

Regeneration Studies in the Sacred Landscapes of Kodagu, Karnataka

K.T. BORAIAH

2002

MAJOR ADVISOR: Dr. R. VASUDEVA

Sacred groves are tiny patches of forests conserved and monitored through social institutions. The regeneration potential of these informally managed landscapes was assessed considering five well-conserved and five disturbed sacred groves in different localities of Kodagu district; while the reserve forests were considered as control.

Diversity ($H1=4.04$) and density of regeneration were higher among conserved sacred groves, which was comparable to that of silent valley, confirming the hypothesis that mild-disturbance promotes higher angiosperm diversity. However, the richness of regenerating species was slightly higher among reserve forests (160), followed by that among disturbed (156) and conserved sacred groves but it was not predictable. *Dimocarpus langan* topped the rank list of IVI in all the three landscapes. Principal Component Analysis revealed that these three landscape support regeneration of distinct sets of species. Regeneration of tree forms was higher in reserve forests; shrub's and climber's were found regeneration well among sacred groves. While sacred

groves supported regeneration of more of bird dispersed species, reserve forests provided ideal niches for mammal - dispersed 'dioecious' species. The richness and densities of 'threatened' and medicinally important plant species were higher among sacred groves suggesting that these tiny landscape are treasure houses of these species. The larger light gaps among disturbed sacred groves resulted in regeneration of more of light-demanding, deciduous types than in conserved sacred groves. In general disturbance parameters increased both the species richness and density. Interestingly, different disturbance parameters showed differential influence on richness and densities of various like forms.

In order to assess the conservation potential of landscape, a new measure called "combined regeneration value (CRV)" was standardized by considering richness of species belonging to special categories such as rare/threatened 'endemic' medicinal' and evergreen'. CRV suggested that larger sacred groves are important for conservation.

AGRICULTURAL ENGINEERING

Evaluation of Aquifer Characteristics in Raichur Taluk

S.V. KAMBLE

2002

MAJOR ADVISOR: M. NEMICHANDRAPPA

Raichur taluk is in the North-Eastern part of the Raichur district of Karnataka, India. The major geological formations in the study area are granites and granitic gneissess. In order to evaluate aquifer characteristics of the study area pumping test¹ and step drawdown tests were carried out on open wells, at selected representative test sites in the study area. This method, Chow method, Theis recovery method and Papadopoulos Cooper method were used for determination of aquifer parameters viz., transmissivity (T) and storage coefficient (S). The average value of the transmissivity and storage coefficient was found to be 58.99 m²/day and 0.1392 respectively. This method

was found to be more reliable for determination of transmissivity and Chow's method was found to be more reliable for storage coefficient determination. Based on the performance of the well in the study area the well design was reported to be satisfactory (well loss coefficient less than 0.53 min²/m²). There did not appear to be any relationship between transmissivity and proportion of drawdown due to well losses. Based on the present study spacing of adjacent wells in this region can be adopted as 80 m. (Theis non equilibrium approach) considering the safety factor also.

Studies on the Performance of Subsurface Drainage System Under Phase-II of Indo-Dutch Network Project in Upper Krishna Command Area

INABATHINI SRIKANTH

2002

MAJOR ADVISOR: M. S. SHIRAHATTI

The study on the performance of the subsurface drainage system was conducted under the Indo-Dutch Network project at Islampur - Devapur villages, in the Gulbarga district under the Narayanpur left Bank Canal of Upper Krishna Command, Karnataka. In the study area of 14.4 ha, the drain spacings of 50 and 30 m were adopted in 12.7 and 1.7 ha areas respectively.

The soil salinity in the root zone has decreased by 10.5 and 64.4 per cent during the pre and post-monsoons of 2000-01 respectively. The salinity reduction was more in the 30 m spacing than that in the 50 m spaced drains. The watertable observations revealed that there was not much improvement in the watertable condition when compared with the pre-drainage condition, which was due to the reason that the area under paddy has increased drastically. But, when compared with that of the control area,

the watertable condition improved significantly. The annual cropping intensity increased from 98.3 per cent during pre-drainage (1998) to 156.2 per cent during post-drainage (2000). The per cent increase in the yields of cotton, wheat, paddy and rabi sorghum were 55, 300, 76 and 40 per cent respectively.

The hydraulic conductivity and infiltration values increased by 10 and 5 per cent respectively over the pre-drainage condition. The salt-water balance studies revealed that an amount of 0.98 and 1.09 tons of salt has been removed from I-I lateral during kharif and rabi seasons respectively. The analysis of the drain discharge revealed that 90 per cent of the times the discharge from the lateral and collector drains were 1.9 and 4.2 mm/d. The study revealed that the average drainage coefficient of 0.8 mm/d may be considered for designing the drainage system.

Optimization of Extent of Vegetative Cover in Water ways For Soil and Water Conservation an Alfisol Using Hydraulic Tilting Flume

J.K. NEELKANTH

2002

MAJOR ADVISOR: B. MAHESWAR BABU

An investigation to study the effects of slope and vegetative cover on outflow and sediment concentration in channels grassed with Bermuda grass in an alfisol was conducted using a Hydraulic Tilting Flume, at the CRIDA, Hyderabad during the period 1999-2000. Vegetative cover of 25, 50, 75 and 100 per cent were used under the slope of 1.0, 3.0 and 5.0 per cent. It was seen that the mean sediment concentration in the outflow was 0.410 g/l at 1.0 per cent slope, 1.353 g/l at 3.0 per cent slope and 2.224 g/l at 5.0 per cent slope and the values differed significantly from each other. When only vegetative cover conditions were considered the lowest sediment concentrations were 0.298 g/l, 0.337 g/l, 0.358 g/l and 0.582 g/l at 25, 50, 75 and 100 per cent vegetative cover as compared to 5.071 g/l

for bare soil. The values for 25, 50, 75 and 100 per cent vegetative cover were on par with each other but, all of them were significantly superior to bare soil condition. When the interaction between the slope and vegetative cover was taken into account it was found to be preferable to go for 25 per cent vegetative cover at all the three slope conditions of 1.0, 3.0 and 5.0 per cent and to let it develop into 100 per cent cover in due course. The outflow was seen not to have been significantly influenced by the slope and vegetative cover. The flow velocity significantly decreased due to vegetative cover as compared to bare soil, but the extent of vegetative cover did not influence the flow velocity significantly at all the three slopes. The cost of establishing the vegetative cover in the hydraulic tilting flume was Rs. 83.33 per sq.m.

HORTICULTURE

Effect of Row Spacing and Nitrogen Levels on Growth, Biomass and Oil Yield of Japanese Mint (*Mentha arvensis* L.)

JAYADEVAPPA A. ASUNDI

2002

MAJOR ADVISOR: Dr. K.N. KATTIMATI

A field study was made with Japanese mint (*Mentha arvensis* L.) cv. Shivalika on sandy loam soil at Department of Horticulture, Regional Research Station,

Raichur during 2000-01. The experiment consists of three row spacing (30, 45 and 60 cm) and five nitrogen levels (0, 50, 100, 150 and 200 kg/ha). The experiment was laid out

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in split plot design. The crop was harvested twice, as at 100 days after planting (DAP) and 60 days after first harvest (DAFH). The oil content was estimated at both the harvests.

The plant height, dry matter production and leaf to stem ratio decreased significantly with increase in row spacing. While, number of leaves, number of branches and leaf area index increase significantly with increase in row spacing (from 30-60 cm). The CGR, RGR and fresh biomass recorded significantly higher at 30 cm row spacing. Oil content increased significantly with increasing row spacing and higher oil content in fresh biomass was recorded at 60 cm row spacing. Higher nitrogen uptake was recorded at 30 cm row spacing. The fertilizer use efficiency (FUE) i.e., nitrogen use efficiency (NUE), apparent recovery of applied nitrogen and physiological efficiency (PE) decreased with increase in row spacing from 30-60 cm in both the harvests.

Application of 200 kg N per ha recorded lengthier plants, more number of branches and leaves. Similar dose had higher LAI, more dry matter production, biomass yield, oil yield and nitrogen uptake in both the harvests. Application of nitrogen from 0-200 kg per ha decreased the leaf to stem ratio. Highest CGR was recorded with application of 50 kg N per ha in both the harvests. While application of 100 kg N per ha recorded maximum RGR in the first and 200 kg N per ha in the second harvest. Increase in nitrogen levels from 50-200 kg per ha increased the NUE, apparent nitrogen recovery and PE in both the harvests.

Significantly more number of leaves, higher dry matter production, biomass yield, oil yield and nitrogen uptake was recorded during both the harvests when the crop was planted at 30 cm row spacing and supplied with 200 kg N per ha. The highest net returns of Rs. 57,890 and benefit cost ratio of 1:2.12 was obtained when the crop planted at 30 cm row spacing and supplied with 200:60:40 N:P:K per ha.

Chemical Weed Control in Onion (*Allium cepa* L.)

SANTOSH ATRE

2002

MAJOR ADVISOR: Dr. P. R. DHARMATTI

An experiments of Chemical weed control was carried out during kharif and rabi of 2000-2001 in drill sown and transplanted onion respectively at Main Research Station, University of Agricultural Sciences, Dharwad. The experiment comprised of 13 treatments in which five different herbicides were used alone and in combination with hand weeding at DAS/DAT) was included as one of the treatments.

The results indicated that, lower dose of herbides in combination with hand weeding at 45 DAS/DAT were quite effective in suppressing weed growth, leading to singificant increase in bulb yield as compared to application of hercidide alone and weedy check treatment in both drill sown and transplanted-onion. Application of pendimethalin 0.75 kg/ha+ HW at 45 DAS in drill sown and 1.0 kg/ha at 45 DAT in transplanted onion was recorded highest weed

control efficiency (90.22% and 84. 31 %) higher bulb yield (18.2 t/ha and 26.6 t/ha) and lowest weed index (12.5% and 2.49%) respectively next to weed free check.

Among the treatments imposed perndimethalin 0.75 kg/ha + HW was noticed the highest (2.33) B: C ratio in drill sown onion. While , fluchloralin 0.75 kg/ha+ HW (3.75) in transanted onion. All the quality parameters viz., total soluble solids, sprouting (%) and rotting (%) did not differ significantly among treatments except, weedy check for rotting in both drill sown and transplanted onion. The fertility status (N, P and K kg/ha) of soil also remained non-significant among the treatments in both drill sown and transplanted onion. Pre-plant incorporation of fluchloralin (1.0 and 0.75 kg/ha + HW) and alachlor 2.5 kg/ha have shown toxic effect in drill sown onion while, oxyfluorfen 0.2 kg/ha as pre-emergence in transplanted onion.

Effect of Spacing and Levels of Nitrogen and Phosphorus on Growth, Flower and Seed yield of China aster (*Callisterphus chinensis* Nees.) Cv. Kamini

P.H. RAJANNA

2002

MAJOR ADVISOR: Dr. ASHOK HUGAR

A field experiment was conducted during kharif 2000-01 at the Regional Research Station, Raichur to study the effect of spacing and levels of nitrogen and phosphorus on growth, flower and seed yield of china aster. The experiments was laidout in split plot design with three

replications comprising of three spacings (main) and five fertilizer levels (sub) forming 15 treatment combinations.

Spacing exhibited significant influence on growth and yield of china aster. Closer spacing of 30 x 20 cm

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recorded significantly higher flower yield (5.42 t/ha) and seed yield (3.90 q/ha) as compared to wider spacings (30x30 cm and 30x40 cm).

Fertilizer exerted significant influence on growth and yield of china aster. The application of 180: 120:60 kg NPK per hectare recorded higher flower yield (5.62 t/ha) and seed yield (3.98q/ha over other levels of fertilizer.

Interactions also expressed their significant effects on growth and yield of china aster. The S_3F_3 (30x20 cm, 180: 120 :60 kg NPK per hectare, respectively)

recorded higher flower yield (6.32 t/ha) and seed yield (4.57 q/ha) over other treatment combinations. Better quality of flowers and seed was obtained under S_1 (30 x40 cm) at F_2 and F_3 levels of fertilizer. The S_3F_2 (30x 20 cm, 135:90: 60kg NPK per hectare, respectively) treatment recorded higher net returns of Rs. 45859 and higher C:B ratio of 2.72 than other treatment combinations.

Spacing and fertilizer levels had marked effects on vase life and shelf life of flowers. Better vase and shelf life of flowers were found in S_1F_2 (30x 40 cm 135:; 90: 60 kg NPK per hectare, respectively) treatment combinations.

Standardization of Time and Method of Grafting in Mango Cultivars in North Eastern Dry Zone of Karnataka

J.M. PRASANTH

2001

MAJOR ADVISOR: Dr. P. NARAYANA REDDY

Studies on standardization of time and method of grafting in mango cultivars in North-Eastern dry zone of Karnataka was undertaken at the Regional Research Station, Raichur during the year 2000-2001.

The mean maximum success and survival percentage of grafts was obtained with Cv. Khader in both epicotyl (63.50 % and 46.60 %) and veneer grafting (65.30 % and 43.60 %), whereas, in softwood grafting the mean maximum survival percentage was obtained (40.52 %) with Cv. Mallika.

Among different times of grafting, the mean maximum survival percentage (52.36 %) was obtained in epicotyl grafting during second fortnight of June. In veneer and softwood grafting the mean maximum survival percentage (57.15 % and 54.56%) was observed in first

fortnight of September. Poorest survival was observed during first and second fortnight of December grafted plants.

Interactions also expressed their significant effects on survival percentage of grafts. The Cv. Khader grafted in second fortnight of June has recorded maximum percentage of survival (70.40 %) in epicotyl grafting over other treatment combinations, whereas, in veneer and softwood grafting Cv. Khader grafted in first fortnight of September recorded maximum survival percentage (76.82 % and 60.14 %) over other treatment combinations.

From the studies it is clear that for Khader, veneer grafting is best method of grafting and it is to be done in the month of September and October. For Baneshan, best time and method of grafting was softwood grafting in the months of August and September. Mallika grafted in the month of September had better success with soft wood grafting.

Influence of Different Source of Nutrients and Ethrel on Yield and Quality Traits of Processing Tomato (*Lycopersicon esculentum* Mill.)

N. KRISHANAPPA

2002

MAJOR ADVISOR: Dr. M.G. PATIL

Field experiments were conducted at the Regional Research Station, Raichur during kharif 2000-01 to study the effect of manures, foliar nutrients and growth regulator on different growth, yield and quality traits of processing tomato (*Lycopersicon esculentum* Mill.) in two separate experiments.

Manurial treatments exerted significant effect on growth, yield and quality traits. Better vegetative growth in

terms of increased plant height, maximum number of branches per plant, stem girth, leaf area, dry matter production, LAI, CGR and RGR were recorded with the application of poultry manure (5t/ha) with full dose of recommended fertilizer (T_3). Yield components viz., number of flowers per cluster (7.66), number of fruits per cluster (7.29) per cent fruit set (96.87), number of fruits per plant (70.73), fruit weight (94.55g) and yield (42.38 t/ha) were observed maximum in T_3 (poultry manure +100% RDF) and

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it was closely followed by T_0 (Poultry manure + 50 %RDF). Quality attributes and uptake of major nutrients were also higher in T_0 followed by T_4 . However, the maximum benefit cost ratio of 4.18 was observed in T_4 (Poultry manure +50% RDF).

Among the foliar nutrients and growth regulator, treatment receiving recommended dose of fertilizer, 0.05 per cent zinc and ethephon 1000 ppm (T_4) produced plants

with maximum vegetative growth as compared to other treatments. Application of recommended dose of fertilizer, 0.05 per cent zinc and ethephon 1000 ppm recorded maximum number of flowers per cluster (7.67), number of fruit per cluster (7.01) per cent fruit set (97.27), number of fruits per plant (70.27), fruit weight (95.5g), yield (37.99 t/ha) and also higher values for TSS (7.67%), pH (4.21). The maximum benefit cost ratio (4.08) was recorded in T_4 (RDF+ 0.05% zinc+ etherphon 1000 ppm).

FOODS AND NUTRITION

Studies on quality Parameters of Girirani Meat and Eggs

S. ANITHA

2002

MAJOR ADVISOR: Dr. BHARATI V. CHIMMAD

Girirani, is a new scavenging backyard poultry breed, for high productivity. This investigation was conducted to evaluate the physico-chemical, functional and organoleptic characteristics of meat and eggs of Girirani in comparison with farm and local poultry birds.

Morphologically Girirani bird resembled local bird, but the meat and egg characteristics were similar with those of farm bird. The edible portion with and without giblet were significantly high in Vencob broiler (79.52 and 72.38%, respectively) than in Girirani (70.83 and 65.75%, respectively). The Girirani meat had higher crude protein (21.45%) carbohydrates (1.35%) and total minerals (1.09%). Organoleptic characteristics were not significantly different. Girirani eggs were brown in colour. The edible portion and internal quality parameters were better in Girirani eggs.

Eggs of Girirani had higher crude fat (1.44%) and total minerals (0.98%), whereas, BV300 eggs had moisture and carbohydrates (75.78 and 3.73%, respectively).

Functional parameters of eggs did not vary. The sponge cakes of the whole eggs of BV300 birds had better cake volumes.

The hard cooked eggs of three birds revealed better taste and flavour characteristics for Girirani and local eggs. Girirani eggs had better keeping quality at ambient as indicated by the internal quality indices.

The study indicated that the meat quality of Girirani was on par with that of farm birds for organoleptic and functional characteristics, but superior in terms of storage characteristics.

HUMAN DEVELOPMENT

Menstrual Problems of School Students in Rural and Urban Areas of Dharwad Taluk

VIJAYALAXMI INAMATI

2002

MAJOR ADVISOR Dr. K. SAROJA

This exploratory study was conducted on a randomized sample of 90 rural and 90 urban school girls, who have reached menarche from government schools in Dharwad taluka.

Interviews were conducted using a self - constructed, pretested schedule for data collection. The data were analysed in frequencies and percentages.

Results revealed that, majority of rural and urban girls came from low socio-economic class and from nuclear families. Mothers of majority of respondents studied upto only primary school.

Majority of respondents were found to have reached menarche around 13-14 years of age. In majority of girls, the period of menses was 5 days. In case of rural respondents the length of the menstrual cycles was found to be longer than those from urban girls.

Majority (89%) of girls found to be suffering from, on an average of three menstrual problems, requiring medical treatments. The most common problems among rural and urban girls was lower stomach pain and pre menstrual tension respectively.

Majority did not take treatments, since they considered these problems as natural and universal. All

girls took bath once a day during menses and barring four girls, the rest used old clothes as sanitary pads. Even though all girls knew about the interval between menses and period of menses, only few had the knowledge of process of menstruation and its importance in reproduction.

Even though all schools were found to have toilets, majority of the girls were found to be not using them during menses, as these toilets were not well

maintained lacking in water facilities and privacy.

The study recommended proper education of school girls regarding the menstrual cycle and its relation to reproduction, importance of taking treatments for menstrual problems and the required proper sanitary care. Good maintenance of toilets with good privacy and water supply were recommended.

HOME SCIENCE EXTENSION EDUCATION

Impact of Selected Non-Governmental Organisations on Rural Women

D. TASNEEM SULTHANA

2002

MAJOR ADVISOR: Dr. CHAYA BADIGER

The present study was conducted to know the awareness, opinion, participation and adoption levels of respondents towards the selected NGO (SAI), operating in Kurnool district of Andhra Pradesh. The information from 150 beneficiaries and 50 non-beneficiaries was collected during 2000-2001.

The major findings were majority (68.66%) of beneficiaries were of young age group, most (73.34%) of them were illiterates, about 57.34 per cent of them belonged to joint family. Major occupation of 67.34 per cent of beneficiaries was agricultural and 32.66 per cent of them were land less. Majority (71.34%) of the beneficiaries had medium level of extension contact, about 82.66 per cent of beneficiaries had medium level of extension participation and about 44 per cent of them had medium level of mass media participation.

Majority (62.66%) of beneficiaries and (54.00%) non-beneficiaries had medium level of awareness about SAI. Majority (48.66%) of beneficiaries and (58.00%) non-beneficiaries exhibited favourable opinion towards SAI. Majority (74.50%) of beneficiaries had medium level of

participation in the activities of NGO. Majority (74.50%) had medium level of adoption.

The selected independent variables like education, extension contact and extension participation had positive and significant relationship with awareness level of beneficiaries. Independent variables namely extension participation had negative and significant relationship with opinion level of beneficiaries, whereas mass media participation had positive and significant relationship with the opinion level of non-beneficiaries.

Independent variables namely age had negative and significant relationship with participation level of beneficiaries, whereas education and extension contact had positive and significant relationship with adoption level of beneficiaries.

The major problems encountered by the beneficiaries were repayment of loan (73.33%) and lack of adequate training facilities (60.00%). Major suggestions made by the beneficiaries were to increase the loan amount (80.00%) and training in different income generation activities (53.33%).

VETERINARY PATHOLOGY

Pathology of Concomitant Effects of Aflatoxin and Carbon Tetrachloride in Pregnant Rabbits (*Oryctolagus Cuniculus*)

PANCHAKSHARI S. SANKH

2002

MAJOR ADVISOR Dr. D.GOPALKRISHNA RAO

A total of 30 rabbits were taken, for this study and divided into six groups of 5 each. Group-I was fed aflatoxin at 1 ppm. Group III was fed aflatoxin at 3 ppm and Group-V was fed with carbon tetrachloride (0.2 ml/kg

body weight). The combine treatment of 1ppm aflatoxin + carbon tetrachloride (Group-II) and 3 ppm aflatoxin + carbon tetrachloride (Group-IV) and control were designated as Group-VI. Treatments started from day of conception to till the end of gestation.

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Clinically, anorexia, dullness, progressive emaciation with decrease in body weight was noticed in all treated group. On necropsy, the gross examination of liver showed dark tan coloured appearance. Other organs like spleen, lung, kidney, caecum and uterus showed dose dependent regressive changes. Histologically, aflatoxin treated liver showed hepatocytomegaly, karyomegaly and bile duct proliferation. Carbon tetrachloride treated group showed, pronounced dysplastic changes in liver cords characterized by rounding and individualization of liver cells with hepatocytomegaly and karyomegaly. Increased mitotic

activity with little amount of fibrous tissue proliferation was noticed. In combined treatments, the dysplastic changes characterized by rounding of cells and hepatocytomegaly were much more pronounced and these could be considered as preneoplastic changes. Surprisingly rabbits liver parenchyma showed little fibrous tissue proliferation consequent to necrotic changes during aflatoxin and carbon tetrachloride toxicity. Aflatoxins are nephrotoxic, embryolethal and teratological abnormalities are not observed where as pregnant rabbits treated with higher doses of aflatoxin with or without carbon tetrachloride had shown resorption of foetuses.

***In vitro* and *In vivo* Evaluation of Pulse Byproducts Based Complete Diets on the Performance of Lactating Goats**

VINAYAKUMAR SANGROLE

2002

MAJOR ADVISOR: Dr. B. RAMACHANDRA

Twenty-five adult lactating Bidri goats were randomly distributed into five groups consisting of five animals in each group. All groups were fed with *ad libitum* complete feed viz., M₁, M₂, M₃, M₄ AND M₅ diets which contain 60: 40, 60: 40, 50:50, 50:50 and 60: 40 Concentrate to roughage ratio respectively. The *in vitro* digestibility study revealed non significant dry matter digestibility in all the five diets and the digestibility of remaining proximate principles were found to be significant ($P \leq 0.01$). The forage fibre digestibility was significantly ($p \leq 0.01$), higher in M₅ diet. The M₅ diet registered Significantly ($P > 0.01$) lower rumen liquor biochemical values. The results of *in vivo* digestibility trial revealed significantly ($P \leq 0.01$) lower DMI in M₅ group and significantly ($P \leq 0.01$) body weight in M₄

group. The digestibility of proximate principles were found to be non significant. The DCP intake was significantly ($P \leq 0.01$) higher in M₃ and M₄ groups. Where as, TDN intake was significantly ($P \leq 0.01$) higher in M₂, M₃ and M₄ groups. The NDF, ADF, cellulose and hemicellulose digestibilities were significantly ($P \leq 0.01$) higher in M₅ group. All the five groups have registered positive nutrient balances. The studied haematobiochemical values of all animals were well within the normal physiological range. Significantly ($P \leq 0.01$) higher milk yield was registered by M₃ and M₄ groups. Considering overall performance contains 50:50 concentrate to roughage ratio was found to be economical when compared to other diets.