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**Himalayan College of Agricultural Sciences and Technology
(HICAST)**
Purbanchal University affiliate
Kalanki, Kirtipur-1, Kathmandu, Nepal

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FOREWORD

Himalayan College of Agricultural Sciences and Technology (HICAST) has been conducting academic programmes in affiliation with Purbanchal University since 2000. Both the bachelor and master degree students must conduct field- and/or laboratory-based research, write and submit thesis based on research findings as partial requirement for obtaining the degree the student is enrolled to. Without being properly and timely published, these research findings cannot reach to wider readership, and continue to remain as decorative materials in the book shelves of the library. Realizing the importance of widely circulating at least the abstracts of those researches an attempt was initiated by us to publish the thesis research abstracts annually.

This publication is a collection of abstracts of 99 thesis researches conducted in 2015-2016. This is the seventh volume of this journal. Relevant thesis can be consulted at HICAST Library for more information.

This volume has seven chapters, viz. agri-economics and business management, horticulture, plant breeding, plant protection, sustainable agriculture, veterinary science, and dairy / meat technology.

I would like to acknowledge all the organisations (GOs, I/NGOs, POs) and HICAST for providing financial as well as other support to the intern students for conducting these researches in various parts of the country. I would also like to thank all graduates of HICAST who sincerely and successfully accomplished their research responsibilities. I also acknowledge all the faculties and scientists who supervised HICAST students to conduct these researches.

It is hoped that the publication will be useful for the students, researchers, teachers, policy makers and development workers. It is the publication that each student of agriculture and veterinary science should possess and read.

1 December 2017
Kathmandu



Binayak P Rajbhandari, PhD
Executive Chairperson

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1. AGRICULTURE

Effect of different level of humic acid on crop growth and soil fertility

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Three experiments were carried out in a laboratory and greenhouse condition from 25th January to 19th March 2017. Earthworm avoidance test was carried out as a laboratory test where as Cress and Chinese cabbage tests were carried out under green house condition at Khumaltar, Lalitpur. The initial soil sample was found to be acidic in reaction. All the experiments were laid out in completely randomized design with 7 treatments and 3 replications. The treatments used were control, only soil (T1), humic acid (HA): soil ratio of 1:10 (T2), HA: soil ratio of 1:20 (T3), HA: soil ratio of 1:30 (T4), HA: soil ratio of 1:40 (T5), HA: soil ratio of 1:50 (T6) and HA: soil ratio of 1:100 (T7). HA showed a significant result in an earthworm avoidance test post 72 hours. T6 was found out to be the most preferred treatment with 163.3 percent preference whereas T2 was the most disliked treatment which was avoided by 66.7 percent of the earthworms. HA had no significant effect on Cress and Chinese cabbage in terms of population, height and number of leaves at 15 days. Perusal of laboratory analysis data showed that application of HA increased organic content, increased soil acidity, decreased exchangeable ammonium without decrease in total nitrogen and increase in available phosphorus. The experiment showed that appropriate concentration of HA in soil for soil faunal population is 1:50. However for crop growth, any of the tested concentration is appropriate.

Economic analysis and marketing dynamics of tomato farming at Lalitpur District

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To assess the economic analysis and market dynamics of tomato farming in Lalitpur district, a survey was carried out by selecting randomly 100 farmer respondents from Mahalaxmi Municipality, Godawari Municipality and Bajrabarahi Municipality. Ten wholesalers from Kalimati and Balkhu vegetable markets, 10 retailers and 5

middlemans were administered from those 3 municipalities were interviewed and with pre-test questioneries. The data analysis showed has higher return per unit of the investment. Economic analysis was done by random sampling 5 farmers based on the area of land. Farmers involved in less than 1 ropani, 1-4 ropani, 4-8 ropani, 8-12 ropani and more than 12 were selected. Each group has 5 farmers. Increased area and input cost of the production have direct effect on profit margin such as in the area less than 1 ropani the profit was NRs 11,350 and in the area, more than 12 ropani was NRs 17,023,2300 which shows the return is much high. In the marketing the profit by middleman, wholesaler and retailer were calculated and also selling price of farmer of calculated which NRs 3 were to middleman, NRs 5 for wholesaler and NRs 17.5 for retailer and also selling price of farmer of calculated was NRs 33.1. Along with the benefits many problems related to the production and marketing of tomato still exist such as price fluctuation, lack of governmental supports. Without strict market policy and support from the government tomato production is likely to decrease in future years.

Effect of organic nutrient management on growth and yield of spinach (*Spinacia Oleracea*) and its residual effect on soil

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A research was conducted to determine effect of organic nutrient management on growth and yield of spinach and its residual effect on soil at HICAST integrated farm, Badegaun, Lalitpur from November 2016 to March 2017. There were five treatments with three replications laid out in randomized complete block design. Area of experimental plot was 2×2.5 m². Treatments applied were T₁ farm yard manure (FYM) at 20 t/ha, T₂ (Vermicompost) at 8 t/ha, T₃ (poultry manure) at 5 t/ha, T₄ (compost) at 16t/ha and T₅ control (farmers practice). Data analysis was done through MS-Excel and Genstat software. The results revealed that there are significant difference in yield per plot and yield per hectare. Maximum yield was obtained from T₄ (compost manure) with 4.34 kg/ha and 9.61 t/ha whereas minimum yield obtained was from T₅ (control). There was significant difference between maximum plant height and maximum number of leaves between treatments. Maximum plant height (16.50 cm) was recorded from T₄ (compost) and maximum number of leaves (10 leaves/plant) was obtained from T₄ (compost). Maximum shelf life (9 days) was recorded in T₃ (poultry manure). Applied treatments influenced significantly in soil nutrient status after harvesting. Maximum pH value was 6.6 and maximum organic matter content in

the soil was 0.43 % obtained in T₄ (compost) and T₁ (FYM) respectively. Highest available nitrogen (416.64 kg/ha), available phosphorus (463.64 kg/ha) and available potassium (49.33 kg/ha) were obtained inrespectively.

Study on efficacy of commercial organic fertilizer on onion

Anuja Khadka

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The study was conducted to observe the effect of different doses of commercial organic fertilizer (black wonder) on onion production and soil fertility improvement in the mid hills at Sainbu Bhainsepati, Lalitpur Nepal during winter 2015 to summer season of 2016. The experiment was laid out in completely randomized block design consisting of ten treatments replicated for 3 times. The treatments were control (no fertilizer) (T1), recommended dose (RD) of N:P₂O₅:K₂O (240:180:80) kg ha⁻¹ (T2), farm yard manure (30 t/ ha⁻¹) (T3), recommended dose of Black Wonder (BW) by company (RBC) (T4), twice the RBC (T5), 1.5 times RDC (T6), half RDC (T7), RDC + RD of N:P₂O₅:K₂O (T8), RDC+ FYM (T9), half BW of RDC + half RD of N:P₂O₅:K₂O (T10). Red Creole variety of onion was selected because it is widely cultivable and is one of the most important vegetables for its beneficial medicinal as well as culinary purpose. After the harvest of onion, the soil fertility was found to be increased after the incorporation of different doses of commercial organic fertilizer as compared to control. Though the result of plant parameters was found both significant and non significant due to application of different organic manures, the response of different doses of organic fertilizer on available phosphorous, available nitrogen, available potassium and organic matter on soil reaction was found statically significant. Combination of RD of fertilizer and BW had best result for plant parameters and soil chemical properties.

Promotional potential of organic farming for livelihoods and socio-economic upliftment of the farmers in Salyan District

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With an attempt to analyze and describe the present situation of the organic vegetable farming and its role on income generation and sustainable livelihood this study was

carried out from November to March 2017 in Salyan District. During the survey three village development committees of Salyan District were purposely selected. The work is based on descriptive study for which primary and secondary source of data were used. Crops under study like cucurbits, solanaceous, cereals, and legumes were organically grown by farmers. Almost all the farmers were keeping livestock mainly cattle and goat followed by buffalo and chicken for the purpose of farm yard manure and milk and meat as animal products. Organic vegetable farming had provided employment opportunity to the members of each family in every season. Health concerns, low cost of production, and easy marketing, were the major reasons for adopting organic technology. Farmers were attracted towards organic agriculture because of the low pesticide exposure and sustainability of agricultural land. Majorities of the farmer were concerned about the health effects of pesticides residue on produce and preferred to purchase the produce grown using organic farming. Opportunities such as low cost of production, increasing demand, increasing soil fertility were also recorded. To minimize the problems and to promote organic vegetable farming it was recommended to make availability of inputs and technology, extension of technical knowledge and skills, managing of organic marketing system and substantial financial support by government for organic farmers.

Present status and role of onion farming in income generation in Bhaktapur District

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Present status of onion production and its income generation in Bhaktapur District was carried out in Madhayapur Thimi Municipality. Many farmers were involved in onion cultivation as the climate was favorable; and it was easy to cultivate. And from this product farmers earned good sum of money and their income generation was also satisfying. Marketing survey was also conducted in Kalimati market of Kathmandu. The sample size included in the study was seventy onion cultivating farmers. Onion cultivation has just been commercially started in Bhaktapur District. Farmers are cultivating onion due to support from some governmental and non governmental organizations (NGO). Improved onion variety Nasik-53, Pusa Red, Agrifound Dark Red and pesticides are provided to the farmers by NGOs. The average per household onion cultivation area was 0.234 ropani. The production of onion per hectare was 20.46 metric tonne. The average cost of onion production per Kg at the farm was Rs

12.92 and average selling price of onion was Rs 25. The benefit cost ratio of onion cultivation in study area was estimated to be 1.95. The potential market for onions is Kalimati vegetable market of Kathmandu. The main problems faced by farmers during onion production were limited irrigation and lack of storage facilities. There were few incidents of downy mildew and black smut diseases. The major problems faced by farmers were available market and low price. The problems faced by traders were storage and price fluctuation. Lack of knowledge about post harvest technology was observed in the study area.

Study on the incidence of aphid in broad leaf mustard in Madhyapur Thimi and NARC Condition

Asmita Bajgain

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The study was conducted in farmers' field in Madhyapur Thimi during Jan 23 to Feb 20, 2016. Forty respondents were involved. According to the farmers surveyed, 57.5% said that the aphid status in the field was increasing due to which farmers had been using the chemicals randomly and haphazardly in order to control the aphid. Farmers' preferred pesticide chemical to control aphids over other methods. However, incidence of aphid varied between very low to medium according to all the farmers field surveyed. The control research was done in Horticulture Division, NARC, Khumaltar, and Lalitpur during Nov. 20- Dec 20, 2016. In the NARC field study there were 7 treatments with three replications. Three observations were performed at an interval of 7 days. These results have been observed by the direct observation and scoring of aphid. These results have been observed due to different kind of genotypic varieties planted in trial with the different level of susceptibility. Field research shows that, incidence of aphid was comparatively high in the genotype HRDBLM001 compared to other genotypes with mean scoring of 2.211 followed by the genotype HRDBLM009 with the mean scoring of 2.167 and incidence of aphid was comparatively low in genotype HRDBLM004 with the mean scoring of 1.622 followed by HRDBLM007 with the mean scoring of 1.666. In comparison of the yield, genotype HRDBLM004 was highly productive with 206.011728 gm/ha followed by HRDBLM010, HRDBLM007, HRDBLM009 and HRDBLM002 with yield 180.785186, 144.014815, 99.503704 and 92.686421 gm/ha, respectively.

Effect of different levels of biochar on crop growth and soil fertility

Asmita Khadka

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To determine preferable concentration of biochar for earthworm persistence and optimum growth of vegetable crop experiments were carried out. Seven different doses of biochar, 0 ton/ha as control (T1), 5 ton/ha (T2), 10 ton/ha (T3), 20 ton/ha (T4), 30 ton/ha (T5), 40 ton/ha (T6) and 50 ton/ha (T7) were used with each three replicates. The cultivars used were German variety of cress and Hong Kong F1 variety of Chinese cabbage at 10 seeds per pot of each. For earthworm avoidance test, 10 earthworms were used per treatment replication. Earthworm population after 72 hours was counted. Data pertaining to different parameters of earthworm movement and plant growths such as no. of plants, no. of leaves, germination percentage, plant height, were measured and statistically analyzed and Soil samples were also collected and analyzed. The result showed that the treatments were significantly different for every parameter except plant height of China cabbage, germination percentage, no. of plants and no. of leaves of cress. Thirty ton/ha was found to have most significant effect in earthworm persistence and in most of the cases. The findings showed that biochar has great effect on change in soil properties like pH, organic carbon and phosphorous and greatest effect in increment of potassium content. However the nitrogen content was found to have decreased to a great extent. Overall, 30 ton/ha of biochar was found to be the most effective for overall plant growth parameters and earthworm persistence but excessive dose of biochar is not beneficial for earthworm and vegetable crops.

Growth, yield, post harvest quality and soil nutrient status of coriander (*Coriandrum sativum*) under organic nutrient management

Asmita Pokhrel

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Study on the growth, yield, post-harvest quality and soil nutrient status of coriander (*Coriandrum sativum*) under organic nutrient management was undertaken in a field at Kirtipur, Kathmandu during the month of October to December 2016. The study consisted of 5 treatments, T₁ (FYM), T₂ (fermicompost), T₃ (poultry manure), T₄ (compost) and T₅ (control, NPK) with three replications. The experiment was laid out

on randomized complete block design (RCBD). All the treatments were applied on the month of October. Parameters like maximum number of leaves, plant height and yield were observed in treatment T₃ (poultry manure). The maximum organic matter percentage was observed with treatment T₂ (vermicompost). Soil available nitrogen, phosphorous and potassium content were observed with the treatment T₄ (compost) and T₃ (poultry manure) whereas, the maximum pH value was observed with treatment T₄ (compost).

Assessment of agriculture, food and livelihood situations among small farm households in Jitpur Phedi, Kathamndu

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The thesis entitled “Assessment of Agriculture, Food and Livelihood Situations among Small Farm Households in Jitpur Phedi” was conducted from February to April 2017, covering a total of 100 HHs. Questionnaire survey, focal group discussion, interview, observations and various relevant publications were used as a source of information. The area was dominated by Brahmin-Chhetri. 68 percent of the respondents were literate. Majority of the families were nuclear. 95 percent HHs were male-headed. 21 percent of the respondents depended only on agriculture for their livelihood. Maximum HHs made more than NRs. 25,000 monthly. 45 percent of HHs had a temporary house. Everyone had access to decent toilet, drinking water and electricity. Majority of HHs possessed mobile phone and television. Telephone service was unavailable. Generally young people used the internet. The FCS for the site was 68.73 which is acceptable. 75 percent of the respondents were small landholders. Main crops grown in the area were Rice, Wheat, Maize and vegetable crops like cauliflower and tomato. Irrigation was entirely rain-fed. Working labor was not available easily. People had access to agricultural and veterinary services. The most disturbing agricultural pest in the area was wild monkeys and wild boars. Only 75 percent of the total respondents reared livestock. Usually, females did the HH chores. Only 31 percent of the total HH had working women. Generally, both sexes were involved in agricultural activities. The trend of land ownerships was highly patriarchal. However, 62 percent of the total HHs involved women in decision making.

Study on chemical and biological properties of soil under long term soil fertility trial in rice-wheat cropping system at Khajura, Nepalgunj

Babita Lamichhan
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A field experiment was conducted to study the effect of organic and inorganic fertilizers from the long term fertility trial in rice-wheat cropping system on selected soil properties. Nine treatments viz. control, 100:00:00; 100:30:00; 100:00:30; 100:30:30; 50:20:20 50:00:00; 50:20:00N:P₂O₅:K₂O kg/ha and 10 t/ha of FYM/compost were replicated three times in randomized complete block design. Soil sample were collected from each plot after rice harvest and subjected to various soil chemical and biological properties analysis. Results of the different level of N, P₂O₅, K₂O and FYM revealed that soil organic matter content was significantly affected due to application of different treatments. The highest percentage of available nitrogen content (0.2%) phosphorus content (30.61kg/ha) and potash content (269.34kg/ha) was obtained from T5 (100:30:30 N: P₂O₅: K₂O kg/ha). T9 (10 ton FYM/ha) also gave considerably higher amount of available nitrogen, potash and phosphorus content which is at par with T5. Similarly, the result of soil organic matter indicates that the highest percentage of soil organic matter was found from T9 (10t/ha FYM) followed by T5 (100:30:30 N: P₂O₅: K₂O kg/ha). Similarly, the highest number of microbial count was obtained from T5 and then from T9 and the least incase of T1. The continuous use of appropriate dose of inorganic fertilizer on the soil system is helpful inincreasing the availability of SOM insoil which has positive correlation in the availability of soil nitrogen as well. Also the use of organic matter like FYM and full dose of NPK inlong term has also similar impact on soil microbial population with its impact on soil sustainability, nutrient availability and stability on crop production. Long term application of FYM and full dose of NPK gives the better result in all of the observed parameters. Application of only N, P, and K individually leads to serious decline in soil fertility.

Study on production, in come and marketing status of mandarin orange in Salyan District

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The study on the production, income and marketing of mandarin orange was carried out at Khalanga and Peepal neta of Sharada Municipality and Katmaula and Dangigaun of Bagchaur Municipality in Salyan District during 12th January to 13th April 2017. The main objective was to access the information about production and market status of mandarin orange and its role in income generation to see the impact of livelihood improvement of rural people in Salyan District. A total of 100 respondents were selected, among them 15 respondents were from Khalanga, 20 respondents were from Peepalneta, 30 respondents were from Katmaula and the remaining 35 respondents were from Dangigaun. Both the gender was found to be involved in mandarin production Eighty percent of the respondents were found to be male and 20 percent were female. Sixty seven percent of the respondents were found to be literate and the remaining was illiterate. The age group of respondent in between 30-40 was found to be maximum involved during study. Majority of the respondents had land holding 0.1-0.5 hectares for mandarin production. Most of the farmers had their own land for mandarin production while few had taken land in lease. Majority of the respondents (22%) had annual income around Nrs.10,000 -50,000. Majority of the respondents (92%) had increment in the annual income after mandarin farming. They were able to increase their higher education, household expenses, health and savings. There were several marketing channel adopted and the most important one appeared to be producer – contractor – wholesaler – retailer – consumer. Dang, Nepalgunj, Dhangadhi, Butwal and the local markets of Salyan were the main market for wholesaler, retailer and contractors. Transportation, irrigation and citrus greening disease were major constraints in Mandarin production in Salyan District.

Production and market status of apple and its role in income generation in Jumla District

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A study on production and market status of apple and its role in income generation was carried out in Jumla District from 16th September to 30th January 2016. The main

objective was to assess status of apple and its role in income generation affecting the livelihood of Sinja valley and Khalanga valley. Altogether 100 respondents were selected randomly for survey and pre-tested questionnaire were used to collect necessary information. Among them 48 respondents were from Khalanga valley, 52 respondents were from Sinja valley. Farmers produced different types of apples but major ones are high chill cultivars such as Red Delicious, Royal Delicious, Golden Delicious, McIntosh, Jonathan, Rome Beauty, Granny Smith, Rich-a-red, and Golden Spur etc. Apple crop producers were 57percent male and 43percent female. Sixty percent of the respondents were literate and remaining 39 percent illiterate. The age group of respondents inbetween 35-45 was found to be maximum in apple production in the study area. Majority of the respondents had land holding 2.5-3.5 hectares for apple crops production. Most farmers had their own land for apple crops production while few had taken land in rent. One fourth of the respondents were generating income more than 4 million (up to 7 million) annually, while average income generation in studied area was found to be 3.5 million per hectare of land. Farmers were aware of fertilizer use as they used organic fertilizer for organic production. Government office, I/NGOs have been playing important role in motivating farmers towards apple production. Jumla Khalanga, Gothijyula and Nagma-bazar were the major local market where as Surkhet, Nepalganj and Kathmandu was the major apple market for both wholesalers and retailers. Transportation, irrigation and storage were major constraints of apple production in Jumla.

A study on production and value supply chain of radish in Bhaktapur District, Nepal

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A study on production and value supply chain of Radish in, Bhaktapur District, Nepal was carried out during December 2016 to April 2017 by using semi-structured questionnaire. The major objective of the study was to assess the different aspects of radish production and value supply chain in Manohara river basin of Madhyapur Thimi which lies in Bhaktapur District. A total of 100 respondents were selected and interviewed from Bode, Nagadesh and Divyashwori. Radishes produced in (April-Oct) are off-season and can be sold at higher price than normal season (Nov- March). Agriculture was the main occupation of majority of the respondent where literacy rate was 59 percent. Only seven percent of the respondents had taken training. YR White

Spring and Green Bow varieties were found popular in the study area, ninety- seven respondents had cultivated it. Severe insect pest and diseases were seen during summer season. Irrigation and marketing of produce at reasonable price were two main problems facing by farmers. Respondents were found lacking knowledge right dose, interval and time of pesticides application. The total average production from one ropani was 2334.8 kg and benefit- cost ratio was 1.7 during the study period. Main market centers are Nagadesh of Madhyapur Thimi, Kalimati and Balkhu of Kathmandu. Trainings, support, information and encouragement from government and non-government sector would be effective to all farmers involved in radish cultivation.

Assessment of poverty and food security situation of dalit community in three VDCs of Salyan District

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Assessment of poverty and food security situation in households (HH) of Dalit community in three VDCs of Salyan District" was conducted during 5th February to April 10th, 2017. Semi-structured, focus group discussion, field survey, and review of literature were done. The study was conducted in 70 households. Out of 70 respondents 69 percent were illiterate. Almost 67 percent were engaged in agricultural works and other involved in foreign employment, tailoring, labour work, studying and carpentering. There was a trend of going to India for foreign employment. Most of the houses were of straw roofed (45%), stone roofed (33%) and (1%) cement roofed. Health post and services were not available. Among 70 respondents, 45 percent were suffering from different types of health problems. Ninety three percent of HH had toilet. People cultivate maize in summer and wheat in winter. Due to sloppy and rainfed land (89%) productivity was low. Annual income of 69 percent of households was found less than NRs 60000. Foreign employment (36%) was found major source of off-farm income. Most of the households 82 percent were drinking water from public tap water. Similarly goat farming was one of the major sources of income of Dalit family which was supported by Nepal Government's Poverty Alleviations Fund. Small land holding, subsistence farming, and tradition of making jand (alcohol) from food grains lead to food insecurity in Dalit community. None of the Dalit HH were food secure, only 4 percent household had food for 9-12 months. It was found that 37 percent HH were mildly food insecure, 45 percent were moderately food insecure and 16 percent were severely food insecure. Focuses should be given on improving

farming practices, creating employment at local level, livestock rearing, implementing scientific agrarian land reform, irrigation facilities and better utilization of food grains within holistic approach.

Assessment of climate change impacts on cropping patterns and crop yield at Kathmandu, Bhaktapur and Kavre Palanchowk Districts

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The study was conducted from 24th January to 15th April, 2017 in three Districts, Kathmandu (Gothatar, Mulpani, Aalapot, Gagalphedi, Bhadrabash, Danchi and kirtipur), Bhaktapur (Sallaghari, Thimi, Katunje, Ghatthaghar, Suryabinayak and Balkot) and Kavre (Saga, Banepa, Janagal and Panchkhal) respectively. The general objective of the survey was to assess the impacts of climate change on crop yield and to analyze the major changes on cropping patterns due to climate change. A total of 90 households were selected randomly. Information was collected from both primary and secondary data sources. This study examines the correspondence of perception of local people about climate change with climatic parameters recorded in Meterological stations. Data on climate parameters were collected from DHM (Department of Hydrology and Meterology). The highest percentages of the respondents (76.66%) were engaged in agriculture in Kavre District as compared to Kathmandu and Bhaktapur District. Similarly, among three District, highest percentage of the respondents (23.33%) were found inbusiness in Bhaktapur and (13.33%) in other services in Kathmandu District. The studies showed that involvement of female population were more than male inagriculture. It was found that some signs of climate change were experienced by farmers of the study area such as: increasing warm days, shortening cold/winter days. Moreover, farmers started feeling scarcity of water for irrigation. Different pests and insects were increasing in farm. There is decreased inproductivity due to climate change. On the other hand, flowering time of different species were changed and so were the germination, harvesting and maturing times of different crops had changed. Farmers were forced to adopt new varieties and change inplanting time to adapt with changing conditions. Incidence of human, plant and animal diseases and natural hazards inrecent years are major threats to livelihood. The study found that people had started adaptation measures autonomously. However, people were unaware of what actually happening to their surroundings.

Site specific nutrient management of rice (*Oryza sativa*) based on nutrient expert model in Dhanusa and Sindhupalchowk Districts

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The study was conducted from September, 2016 to April, 2017 to analyze site specific nutrient management of rice based on nutrient expert model (NEM) at Dhanusa and Sindhupalchowk Districts of Nepal. Mithila Municipality from Dhanusa (lowland) and Chautara Municipality from Sindhupalchowk (upland) were selected purposively. The questionnaire survey and the method chosen were random. Total of 46 farmers were selected randomly for the study; 23 each from Sindhupalchowk and Dhanusa. The respondents for the questionnaire survey were randomly selected. Majority of farmers (78.26%) from Dhanusa District had land holding of <1ha. Similarly, 100% of farmers from Sindhupalchowk had land holding of <1ha. Almost 100% of respondents from Dhanusa had got irrigation facility. Similarly, 13.04% of respondents in Sindhupalchowk do not have irrigation facility. The yield from farmer's current practice (FCP) was found 6.30 ton ha⁻¹ and 6.12 ton ha⁻¹ at Dhanusa and Sindhupalchowk Districts, respectively. Similarly, from NEM, it shows that recommended practice (RP) may help to produce 7.12 ton ha⁻¹ and 6.74 ton ha⁻¹ at Dhanusa and Sindhupalchowk Districts, respectively. Average revenue at FCP from Dhanusa and Sindhupalchowck were found Rs. 165,469.64ha⁻¹ and Rs. 281,526.19ha⁻¹, respectively. Similarly, average revenue at RP in Dhanusa and Sindhupalchowk were found Rs. 186,320.26 ha⁻¹ and Rs. 314,000ha⁻¹, respectively. Cost for inorganic fertilizers in FCP and RP were found Rs. 7,130.22ha⁻¹ and Rs. 8,765.53ha⁻¹, respectively in Dhanusa District. Similarly, cost for inorganic fertilizers in FCP and RP were found Rs. 3,708.35ha⁻¹ and Rs. 16,970.51ha⁻¹, respectively in Sindhupalchowk District. The net more benefit of Rs. 8,982.16ha⁻¹ in Dhanusa and Rs. 19,231.93ha⁻¹ in Sindhupalchowk were found in RP over FCP. Response of NPK was found 2.29, 0.81 and 0.70 ton ha⁻¹, respectively in Dhanusa District. Similarly, response of NPK was found 2.25, 1.03 and 1.00 ton ha⁻¹, respectively in Sindhupalchowk District.

Status and prospects of kiwi farming in Dadeldhura District

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The study was conducted in Dadeldhura Districts from January to March 2017 to assess the status of kiwi production and its prospects for area expansion. The questionnaire and method chosen were random. A total of 23 households engaged in Kiwi farming were selected randomly. The study showed that female population involvement was more in agriculture than male. About 53 percent of farmers were involved in agriculture sectors. All of the farmers had got <1ha of land. Kiwi fruits could be grown in wider range of soil types. Farmers used locally available farmyard manure, household wastes, dead and decayed plant leaves as fertilizers. 5X6 meters plant-to-plant and row-to-row distance were maintained and well prepared pit of depth of 1X1X1 cubic meter were made to plant kiwi during winter or early spring. In the study area weeding was not practiced frequently however, when weeds were appeared massively hand weeding was done. Allison and Monty were the mostly cultivated varieties. Generally harvesting was done by hand picking when the stiff hairs started falling and fruits were peeled when rolled with thumb. The estimated yield of 15-20/MT per hectare was obtained from both the varieties. Since the fruits were produced for self-consumption at present post-harvest technologies were not adopted. Training and pruning of kiwi fruits were done as per the supervision of District Agriculture Development Office (DADO). Among 23 farmers surveyed, 9 farmers were trained by local NGOs named as RBW-RMP, 12 farmers by Everything Organic Farm and DADO and 2 farmers were not trained but were motivated by neighbours. The fruits were sold to wholesalers, retailers and direct consumers and the main potential market sites of this area were Kailali, Nepalgunj, Mahendranagar and Kathmandu.

Effects of altitudinal variations in fruit quality parameters of sweet orange in Dadeldhura District

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The study was carried out in 1400 masl, 1700 masl, 2000 masl altitudes from September, 2016 to February, 2017 in Dadeldhura District, Nepal. The most important and reliable judging criteria of fruit quality parameters in sweet orange are fruit

weight, fruit diameter, external color of fruit, peel diameter of fruit, peel weight of fruit, number of segments in a fruit, number of seed in a fruit, pulp weight of fruit, juice content by a fruit, acidity (pH) of the fruit, total soluble solids (TSS) of fruit, status of the disease and pest etc. For this study 8 trees from each altitude and 10 fruits from each tree were taken. It was recorded that among three altitudes 1400 masl had the good fruit quality parameters (such as weight of fruit, diameter of fruit, peel thickness, juice content, pH value of fruit juice, vit.C content etc) compared to other two altitudes (1700masl and 2000 masl). The average fruit weight (170.625g) and average fruit diameter (6.97cm) was maximum; and peel thickness was found minimum (0.4mm) in 1400 masl. The TSS and number of segments, number of seeds per fruit was observed high in 1700 masl, i.e. 11.13 and 10.8 and 25.2° Brix respectively. The average juice content (78.89ml), pulp weight (32.67g) and pH (4.57) value was observed highest in 1400masl. The vit.C content was found highest (74.22mg/100ml) in 1400 masl. The incidence of disease and pest was observed minimum in 2000 masl (no incidence).

Organic agricultural practices and resources used in Lalitpur District

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This study of organic agricultural practices used in Lalitpur district was carried out from March to May 2017. The site of study was Lalitpur district of Kathmandu Valley of Bagmati Zone. In comparison to the number of the organic vegetable consumers, this district had higher number of consumers of organic farm products than other districts. For the study, 30 farms were selected and the owner of the farms was interviewed. The study revealed 86 percent of the respondents were educated whereas 14 percent were just illiterate. 83 percent of the respondents were properly trained for specific organic farming techniques and 17 percent were not trained. The number of the male involved in organic vegetable production was 80 percent whereas 20 percent of the female were involved. The reason for less number of female involved in organic farming is due to patriarchal system of the society. The involvement of farmers from age group 41-50 years was 43 percent as most of the people aging less than 40 years were outside the country for employment and study purpose. Only 23 percent of the farm owners had documented their daily farm record whereas remaining 77 percent of the farmers did not keep farm records. The use of coco-pit, compost, bone meal, blood meal and animal manure were found for the plant nutrition. In most of the farm, timely

irrigation, weeding, proper mulching and harvesting were done according to the crops cultivated. The management of different diseases and pest were done by using locally available organic products like neem, chilly, banmara, titepati, turmeric, garlic, ginger, onion, sunflower etc. Jholmol was the basic plant protection method in all the organic farms. Only few of the organic farms were certified and some were in the process of farm certification whereas other farms were uncertified.

Commercial tomato grower's management practices against *Tuta absoluta*

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The field study was carried out from January to April 2017 to analyse the damage and management practices against *Tuta absoluta* (tomato leaf minor) adopted by commercial tomato growers in Kathmandu, Lalitpur, Bhaktapur and Kavre Districts by purposively selecting 203 households. Data were collected by using semi-structured questionnaire. The survey revealed that majority of the respondents belonged to the age group of 30 to 50 years. Most of the respondents had primary level education. About 82 percent of respondents were involved in agriculture as their primary occupation. Production had increased in all four Districts since the IPM approach was used. Comparing yield data of year 2015 and year 2016, there was huge loss in production in the later year. At first, farmers didn't know the pest management aspect so production was very low. In almost all study sites, *T. absoluta* outbreak was observed. Insect pests' population and diseases were found decreasing due to the improved cultivation practices and better pest management practices. Besides *T. absoluta*, white fly and fruit worm were seen as second and third serious insect pests, respectively in tomato. Average loss percent in yield due to *T. absoluta* was 42.33 percent in Kathmandu, 47.16 percent in Bhaktapur, 50 percent in Lalitpur and 57.51 percent in Kavre District. Majority of the respondents in Kathmandu (55%) were using chemical pesticide plus bio-pesticides for the management of insect pest while 35 percent of respondents were using only chemical pesticides. Many respondents in Bhaktapur (45%) were using only chemical pesticides while 40 percent of respondents were using chemical plus biopesticides. Whereas in Lalitpur, 43 percent were using chemical pesticide and bio pesticides for the management of insect pests and only 31 percent of respondents were using only chemical pesticides. The chemical pesticides used included Emar, King Hunter, Kingstar, Alcora, and Biopesticides like Dadagaard

and sex pheromones was also used. The IPM trained farmers were much aware about the safety measures.

Comparative study on benefit cost ratio of major leafy vegetable crops in Bhaktapur District

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A comparative study on benefit cost ratio of spinach, fenugreek and cress was carried out in Madhyapur Thimi, Saraswati and Anantalingeshwor municipalities of Bhaktapur District from January to March, 2017. Altogether sixty households were selected for the interview with the help of a semi structured questionnaire. Out of 60 respondents, 20 were randomly selected from each municipality. There was no any special market for leafy vegetable crops. The benefit cost ratio of spinach, fenugreek and cress were 2.36, 2.01 and 1.40 respectively. The highest B: C ratio of spinach could be attributed to lesser cost of production and higher yield. The average yield of spinach was 2950 kg/ropani whereas the market price was NRs 28.5. The average yield of fenugreek was 2625 kg/ropani whereas the market price was NRs 25. The average yield of cress was 2575.7kg/ropani whereas the market price was NRs 29.5. The main problems faced by the farmers during vegetable crops production were high incidence of diseases and insect pests. This was mainly due to poor knowledge on proper identification of diseases and pests. The second most important problems faced by the farmers were lack of quality seed materials and lack of irrigation facilities.

Club root Disease and its management practice adopted by farmers in Kathmandu Valley

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The present survey on club root disease and its management practice adopted by farmers was carried out in Kathmandu valley to find out the present scenario of club root disease in cruciferous crop and the management practices. One hundred respondents were purposively selected from three District: Kathmandu, Lalitpur and Bhaktapur. The data were collected from 100 farmers with 33 farmers from each

Districts Kathmandu and Lalitpur and 34 farmers from Bhaktapur. Primary data were collected using questionnaire survey, key information interview and focus group discussion. Secondary data collection was done from reports, publications of different organizations and libraries. Among total respondents, females were found actively participated in agriculture as compared to male in Kathmandu valley. In most of the cases, farmers had the tendency of growing cauliflower and broad leaf mustard (BLM). Majority of the farmers preferred to grow vegetable crops due to its short durations and its productivity, high economic return and continuous income source. The major production constraint faced by these farmers was insect pests and diseases. The trend of clubroot disease in farmer's field was increasing every year. It might cause a huge loss in the production of cruciferous crops of that area in near future. The disease incidence and severity was mostly seen in cauliflower and BLM. After the clubroot disease invasion, the production level decreased. Majority of the farmers practiced coating seeds and soil treatments to prevent clubroot disease transmission. For the control of the disease most of the farmers followed crop rotation. According to the respondent farmers, the clubroot disease infection was more common in cauliflower and BLM as compared to other cole crops. Farmers used ash and cow urine as local remedy for the disease but they could achieve only minor control over the disease.

Production techniques and marketing of green garlic Madhayapur Thimi Municipality, Bhaktapur District

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A study on production techniques, problem and marketing of garlic was conducted at Monahara and Saghbari Village Development Committee (VDC) in Bhaktapur District. The study was performed from Dec 2014 to Feb 2016, using simple pre-tested questionnaire. A total of 100 respondent farmers were selected and interviewed. Agriculture was the main occupation of majority of the respondent whose literacy rate was (32%). Most of the respondents were found cultivating local variety. Majority percent of respondents were selling their product in nearby local market. The main problems were irrigation, yellowing of leaves. Twenty seven percent farmers' crops were affected by the disease. Main market centers are Kaushaltar, Gatthagar, Kama Binayak, Thimi and Patan. Involvement of male population was higher than female population. Garlic is deficient during rainy season when its price is high and it is

mostly imported from India to meet the demand. Farmers should be aware about the knowledge and skill on garlic production, pests and disease management as well as marketing. Farmers harvest garlic lately due to lack of storage facility and absence of organized market resulting in to sale in lower price. Trainings and support should be provided to all farmers involved in garlic cultivation and farmers should be encouraged to cultivate improved variety and support program should be done accordingly.

Pest and disease surveillance of vegetable crops and its management practices adopted by the farmers in Banke and Surkhet districts

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A study on pest and disease surveillance of vegetables and its management practices adopted by the farmers in Banke and Surkhet districts was carried out from 9th January to 30th April 2017. Altogether 158 respondents were selected for primary data and information collection. Among them 90 vegetables producers and 4 agro-vets from Banke and 60 vegetables producers and 4 agro-vets were from Surkhet. In case of the age group, 40-50 years age group in Surkhet and 30-40 years age group in Banke were engaged in vegetable farming. Majority of farmers of Banke district was dominant by the Tharu community where as in the Surkhet district Bramin caste was dominant. Agriculture was the major occupation in both Districts. Majority of the farmers had average land holding 1-3 ha. Sixty five percent of the farmers were selling vegetables through the channel of commission agent. Insect pests and diseases were major problems of vegetables farming in both districts. In case of the onion, onion thrips and onion maggot were the major insect pests and purple blotch and onion smut were the major disease in both districts. In case of okra, okra fruit and shoot borer, flea beetle was the major insect pests and yellow vein mosaic, powdery mildew were the major diseases. In case of chili, chili thrips, fruit and shoot borer were the major insect pest while major diseases were damping off and anthracnose. In case of French bean major insect pests were chickpea pod borer, chili thrips and diseases were alternaria leaf spots, anthracnose. Fusarium wilt was found in the both districts. Majority of the farmers (75%) were using chemical pesticides plus cultural practices, 18% were using biological plus chemical and few (5%) were using only chemical pesticides for insect pests and diseases management in both districts.

Effect of organic vegetable production on food/nutrition and livelihoods security of households in eco-villages at Dang

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The present survey on effect of organic vegetable production on food/nutrition and livelihood security of households in an eco-village was conducted in Dang District. The general objective of the survey was to assess the food/nutrition and livelihood security of households in eco-village through the help of organic vegetable production. The method of survey was mainly focused on collecting data by directly interviewing targeted groups such as farmers, consumers, traders and agro-vet owners through random selection. So, the study was carried out for two and half months from December 16th to 10th February 2017. During the survey 3 eco-villages namely Paddha, Urahari and Chakhaura were studied. The total sample size was 95 consisting of 90 farmers from eco-village and 5 agrovets from these 3 eco-villages and nearby market Tulsipur. From the survey, it was found that the price of the produce was mainly fixed by negotiation between the parties but farmers were not getting any regularity of premium price. The cost of production of organic farming in comparison to conventional farming was found to be cheaper but productivity of organic produce is less. Farmers were attracted towards organic vegetable production just for home consumption only because of the low pesticide exposure and sustainability of their agricultural land. Moreover consumers were not concern about the organic produce and harmful effects of inorganic produce. Moreover consumers were not willing to pay premium inprice for organic produce if assuring label is given at the point of sale.

Effect of integrated plant nutrient management on the growth, yield and soil nutrient status of broad leaf mustard (*Brassica Juncea var rugosa*)

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An experiment was conducted to evaluate the effect of IPNM on the growth, yield and soil nutrient status of broad leaf mustard (*Brassica juncea var. rugosa*) in the farmer's field at Bigam VDC of Dakshinkali Municipality located in Kathmandu District during October 2016 to February 2017. The experiment was laid out in a Randomized

Complete Block Design. There were 9 treatments viz. T₁ (½ NPK+6ton/ha vermicompost), T₂ (¾ NPK+3 ton/ha vermicompost) T₃ (½ NPK+12ton/ha FYM), T₄ (¾NPK+6ton/ha FYM), T₅ (½NPK+2 ton/ha poultry manure), T₆ (¾NPK+1 ton/ha poultry manure) T₇ (½ NPK+6ton/ha compost), T₈ (¾NPK+3 ton/ha compost) and T₉ (control) with three replications. All the treatments were applied in the month of November. In the study maximum plant height, number of leaves per plant, leaves size, shelf life, yield per plant, yield per plot and yield per hectare were observed with the treatment ¾ NPK+3 ton/ha vermicompost. Similarly, the maximum plant canopy volume was found in the treatment ½ NPK+6 ton/ha compost. The soil pH value was neutral in ¾NPK+1ton/ha poultry manure. Similarly, the maximum organic matter percentage was recorded in ½ NPK+6 ton/ha compost. The highest soil available nitrogen, phosphorous and potassium were found in the treatment ¾NPK+1ton/ha poultry manure, ½ NPK+6 ton/ha compost and ½ NPK+6 ton/ha vermicompost, respectively.

Major diseases of banana and farmer's management practices in Chitwan District

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The study on major diseases of banana and its management practices by the farmers in Chitwan District was conducted from November 2016 to January 2017. There were around 625 banana farmers cultivating in around 1666.67 ha (2500 Bigas) of land. Randomly 50 respondents were selected from Ratnanagar Municipality (Padampur, Bachhauli, Pithuwa, Chainpur, Kumroj, Jutpani) and 30 respondents from Meghauli, Prembasti, Mangalpur, Patihani, Parbatipur and Jagatpur. The survey revealed that majorities were males (65%) with majority (57.5%) of the respondents between the age's group 35 and 50 years having landholding of 2.05 ha/family, over three-fourth of land with irrigation facility. The farmers had multiple problems like lack of proper field sanitation, lack of improved saplings, and lack of proper irrigation facilities, insect pests and diseases. In the field studies, plant disease was assessed on visual observations based on disease score and disease severity. Among the diseases, major economic loss accounted for sigatoka leaf spot and bunchy top virus with little presence of panama wilt and bacterial wilt. The incidence of leaf spot disease was around 62% with severity of 13%. And it is on the increasing trend if proper managerial practices are not followed. The presence of insect-pests like pseudo stem weevil and rhizome weevil were of much economic importance since 95 percentages

of the respondents whined about it. Insect pest and disease management practices were highly chemical intensive (Dithane M-45, Nuvan and Plantomycin were dominating in the study area) followed by few cultural practices. The recommendation on the time and dose of agro-chemicals were mainly provided by the technicians and Agro-vets. Besides pest and diseases, the soar in the land price in Chitwan has led to the destruction of farming land into housing plots that can possibly lead to reduced banana farming in the near future.

Major insect pest management practices of cole crops in Gothatar, Kathmandu

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A study on major insect pest management practices of cole in Gothatar Kathmandu District was carried out from January to May 2017. Primary data was collected from 50 respondents using semi-structured questionnaire and thirty respondents were chosen randomly to assess the status and occurrence of major insect pest of Cole crop and management practices adopted by farmers. Secondary data was collected from available literature, books, journal, research papers and libraries. The survey revealed that majority of the respondents are male and mainly newer community is residing in the study area. Regarding the insect pest incidence aphid shows higher incidence followed by cabbage butterfly and DBM. Cabbage looper and cabbage butterfly have potentiality to cause economic damage to them and other insect pest like cutworm and tobacco caterpillar is very few in numbers. The pest status was found to be increasing each year due to inappropriate management practices followed by the farmers. Farmers use cultural and chemical methods as a pest management strategy. About forty eight percent of the respondent use chemical methods for controlling the pests. Thirty seven percent use cultural method in Kangeswori Kathmandu Districts. Commonly used insecticides that are used by farmers were chloropyrifos, dimethoate, Malathion, cypermethrin, imidachloropid and dichlorovous. The indiscriminate use of chemical pesticide has resulted pest resistance, resurgence and sometimes outbreak. Majority of farmers were unaware about methods of pest management other than chemical methods.

Green onion production techniques and marketing in Madyapur Thimi Municipality, Bhaktapur District, Nepal

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A study on green onion production techniques and marketing in madhyapur Thimi Municipality, Bhaktapur, District, Nepal' was conducted from Dec 2016 to April 2017 by using semi - structured questionnaire. A total of 100 respondent farmers were selected and interviewed. Green onion was one of the most important high value income generating crops in the study area. Almost 75% of the respondents were found to cultivate Japanese variety called Natsuyo. Almost 86 % of the respondents sold their produce at nearby local markets. The main problems of the study area were lack of irrigation and marketing of the produce at reasonable price. Main marketing centers were Nagadesh of Madhyapur Thimi, Kalimati and Balkhu of Kathmandu. Almost 50% of the respondents had direct contract with the noodle factories. Almost 86% of the male respondents were involved in marketing. Onion was in short supply during August to February, when its price was the highest with Rs 70/ kg. Severe problems of purple blotch, yellowing and thrips occurred during summer season. The respondents were found deficient in the skill of cultivation and the knowledges about correct dose, frequency and time of pesticides application. The respondents had no exposure to any technical training on scientific cultivation practices. Economic analysis showed that green onion was highly profitable enterprise with a benefit cost ratio of 2.3.

Cropping system practices adopted by the farmers of Kageshwari-Manohora Municipality in Kathmandu District

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The study was conducted from 24th January to 15th of April 2017 to identify the cropping system practices adopted by the farmers of Kageshwari-Manohora Municipality in Kthamndu District. A total of 100 households (HHs) were selected randomly comprising six places of Kageshwari-Manohora Municipality. The study showed that female population involvement was more in agriculture than male. About 70 percent of farmers were involved in agriculture sector. About 90% of the farmers have got < 1 ha of land. The study showed that most of the farmers were small

marginal farmers. The mostly adopted cropping system practices were rice-wheat cropping system (60%). Most of the HHs depended on rainfall for irrigation in case of rice but very few farmers (10%) have canal passing nearby their farm. 95% of the HHs applied chemical fertilizers for the cultivation of crops. Khumal-4 was the most prominent varieties of rice grown by most of the farmers. Mostly grown varieties of maize, wheat and potato were Kanchan, Gautamand Cardinal, respectively. The disease incidence of blast, leaf rust, brown spot and blight were found in rice, wheat, maize and potato, respectively and insect incidence of rice borer, red ant and maize borer were occurred in rice, potato and maize, respectively. Only 5% of the farmers were well known about sustainable agriculture. Maximum numbers of farmers have faced the problem of insufficiency of food, as their farm size was too small to fulfill the food needs of their family members.

Study on the use of organic fertiliser and cropping system for crop productivity and soil sustainability in Bhaktapur District

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A study on use of organic fertilizer, cropping system and soil sustainability in Bhaktapur District was carried out. Organic fertilizers were not prepared and stored properly leading to loss of valuable nutrients. Organic fertilizers were therefore insufficient alone and had to be used with chemical fertilizers. Respondent's interviews were taken in Nagarkot, Bageshwori, Sudal, Tathali, Nangkhel, Sipadol, Gundu, Dadhikot, Madhyapur Thimi, Jhaukhel and Changunarayan, from January to April, 2017. Total of 90 respondents were selected randomly for the survey. Primary and secondary sources of data were used for descriptive study. Rice crop was followed by all of the respondents although wheat and maize crops were being slowly replaced with vegetable crops. Sixty four percent of respondent carried out agriculture for subsistence purpose and 49 percent of respondent had less than 5 ropanis of land. It was observed that 64 percent had their own sources of manure. Combinations of organic and inorganic fertilizers were applied by majority of respondents. According to respondents application of only chemical fertilizers and organic fertilizers alone did not supply enough nutrients to crops to produce high yield. Rice –vegetable cropping system was followed by most of the respondents (42 %), whereas 37 percent followed conventional method of rice-wheat cropping system. Monoculture was followed by 60 percent of respondent. Organic fertilizers were used by more than 80 percent of respondent in combination with chemical fertilizers and less than 20 percent of

respondents were either purely inorganic or organic. Integrated method where chemical and organic fertilizers were used, in combination and rice –vegetable cropping system appears to be the best option for soil nutrient management followed by most of the respondents. .

Production practices and marketing of cauliflower crop in some Municipalities of Lalitpur District

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A study on production practices and marketing of cauliflower crop in some municipalities of Lalitpur District" was carried out from January to April, 2017. All together 100 respondents were selected for field survey employing random sampling technique. Sixty percent males and 40 percent females were involved in cauliflower farming. Fifty six percent of the respondents between the age 30-50 years were involved in cauliflower farming. Twenty eight percent of the respondents were illiterate. Among the remaining respondents 33 percent were at primary, 22 percent at secondary, 14 percent at higher secondary and 6 percent at higher degree level. Majority of the respondents (40%) had land holding 1- 2 ropani for cauliflower production. Seventy four percent of the respondents had taken land on lease on top of their own. Net profit was NRs. 3335/ropani and Cost benefit ratio was 1.22. Net profit to the producer and producers' share on consumers' price decreased as the length of marketing in the channel increased. However, the farmers were using long channel due to the bulkiness of produce and easiness in marketing. To increase producers' share on consumers' price, unnecessary middleman and commission agents should be avoided in marketing of the produce through group approach and cooperative system. Major constraints involved in cauliflower production and marketing were lack of technical knowledge, high incidence of insect pests and diseases, inadequate irrigation and credit facilities, lack of proper storage and transportation.

Impacts of organic vegetable farming in livelihoods of farmers at Bhaktapur District

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A study on impact of organic vegetable farming in livelihood of the farmers at Bhaktapur District was done. The aim was to analyze and describe the present situation of organic farming and its major role in income generation and livelihood of the farmers. The study was conducted from January to April, 2017 in which 80 households were asked with prepared questionnaire. This is a descriptive study based on primary and secondary sources of data. Majority of farmers involved in organic vegetable production was satisfied with the outcomes of this farming system. Organic farming has provided employment opportunity to the members of each family in every season. After the involvement in organic farming, farmers had improved their livelihood status, health status of the family, child education and annual saving. Farmers were attracted towards organic farming because of low pesticide exposure and sustainability of their agricultural land. Majority of the farmers were concerned about the health effect of synthetic fertilizer and pesticide residue on produce and preferred to purchase the produce grown using organic farming. It also showed that now-a-days farmers were not only concerned about their health but also were aware about the impacts of conventional farming in the environment and thus has started eco-friendly farming system. Similarly, higher benefit cost ratio was found in organic production system. This revealed that adoption of organic farming system was economically profitable and was making significant contribution to the reduction of food insecurity and improvement in the sustainable livelihood of the farmers. Major problems faced by the organic farmers are lack of proper market facility, inorganic farming system practiced by other farmers in the same area which invited pest to their field resulting to low yield.

Insect pests of tomato and potato, and their management practices adopted by farmers in Kathmandu Valley

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The survey was conducted to know about the occurrence of insect pest in tomato and potato, and the practices adopted by local farmers for their management from January 8 to April 26, 2017. Total 97 farmer were interviewed randomly from Ramkot, Gotthatar, Lele and Gamcha. Majority of farmer belonged to 31-40 age groups accounting 35% and most of them were females. Education status of 75 % respondents was primary level. Despite of their low education level, 44% of respondents were acquainted with IPM related trainings. There were many insect pests attacking different parts of tomato and potato, like South American tomato leaf miner, tomato fruit worm, tobacco caterpillar, aphids, whitefly, PTM, white grubs, red ants. Among them South American Ttomato leaf miner and PTM were found to be more problematic causing high economic loss. The report shows that the loss was found high in Lalitpur. (76 %) were found to be using drip irrigation method because it is simple, easy to use and helps to sustain water longer during dry spells. Regarding tomato, in an average, 52 % of crop damage occurred in Lalitpur. In potato, in an average, 35% of crop damage occurred in Lalitpur. Attempts were made to reduce the damage.where (93%) used cultural control method, 24% used biological control method, 29% of respondent had used semiochemicals and 57% of respondent used chemical control method of pest management practice. In case of botanical and biological pesticide they used *Artemisia vulgaris*, *Eupatorium*, *Azadirachtin*, solely or along with cattle urine. They also used sex pheromone traps like cue-lure, heli-lure, spodo-lure, TLM lure. Due to low impact of chemical pesticide and lack of knowledge of right dose, 24% were found to be using more than recommended dose. Insect pest, disease, fertilizer, irrigation, labor problem was the major constraint of study area.

Land capability and soil assessment of agriculture land use in Jagannathpur VDC, Parsa District

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A survey was done on land capability and soil assessment of agriculture land use in Jagannathpur VDC, Parsa District to classify the lands on the basis of their capabilities and assess its soils according to USDA Taxonomy. The study was carried out from January 2017 to May 2017. Sampling was done in 9 points according to different land system. Soil samples were collected from each of the nine pits and analysed in laboratory for estimation of nitrogen, phosphorus, potassium, boron, zinc, pH, organic matter and texture. Land system and land capability classification of the region was studied by LRMP database and direct observation. Soil classification was done by studying the diagnostic features of the soil profiles and the temperature and moisture regimes of that region. Statistical analysis of the recorded data was done by MS-Excel and GenStat. The study revealed that Jagannathpur VDC contained Inceptisols and Entisols with four suborders; Ustepts (44.45%), Udepts (22.22%), Fluvents (22.22%) and Psamments (11.11%). The region had four different classes of land types with the most being IAh/1, covering 88.12% of its land area. The land was suitable for agriculture purpose supporting a variety of crops. The soils upon analysis showed low levels of nitrogen in most areas (47.325%). Phosphorus levels were very low for 32.16% of the region with Potassium levels at 52.026% of the total VDC area. Jagannathpur VDC showed very low levels of Zinc covering 85.57% of its area while Boron levels were medium and very low in most parts at 38.97% and 37.82% of the land area respectively. Soils of the region were moderately acidic for 50.92% of its area while the Organic matter content was very low in 79.614% of the VDC area. The most prevalent soil texture was silty clay loam covering about a quarter of the VDC land area at 26.38%.

Effect of various organic nutrients on soil composition, growth and yield of cress

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The present on effect of various organic nutrients on soil composition and growth and yield of cress (*Lepidium sativum*) was carried out in farmer's field at Lokanthali, Bhaktapur during winter season of 2016. There were five treatments applied with

FYM at 16kg/plot (T₁) vermicompost at 4 kg/plot (T₂), poultry manure at 2.66 kg/plot (T₃) compost at 8kg/plot (T₄) and control (farmer practice) with three replications. The experiment was laid out according to Completely Randomized Block Design (RCBD). Kathmandu Local variety of cress was selected. In the study, maximum number of leaves and yield were observed in treatment poultry Manure (T₃). The maximum plant height, shelf life and phosphorous were obtained in treatment vermicompost (T₂). The maximum pH was observed in treatment FYM (T₁). Maximum potassium and nitrogen were observed in treatment Poultry Manure (T₃).

Status of major potato diseases and its management practices adopted by farmers in Kavrepalanchowk District

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A study on status of major potato diseases and its management practices adopted by farmers in Panchkhal, Nala, Tucuccha, Panauti, Ugratara, Banepa, Kusha Devi, Sanga and Dhulikhel of Kavrepalanchowk District was carried out. Easy cultivation practices and high lucrative crop was the main reason to grow potato in the study area from March 2017 to May 2017. Purposively 100 household were selected. Majority of the respondent was found between age group 40 to 60 (46 %). Fifty eight percent of the involved farmers were male. Illiterate farmers were 38 percent, 35 percent got education only up to primary level, 22 percent got secondary education and only 5 percent got higher education. Their major occupation was agriculture (55 %). Most of the respondents used to follow paddy-potato-potato cropping pattern. Janakdev (46 %) and Desire (31 %) was the most preferred potato variety. The status of disease infestation was increasing than that of previous year because of continuous cultivation of same crop and same variety year after year. Late blight was found major disease in the study area with the average intensity of 31 percent. Farmers were giving major emphasis for the chemical methods of disease control (48 %) than cultural method (32 %) and IPM (20 %). Use of only cultural method was not enough to mitigate disease infestation hence there was compulsion for farmers to use chemical pesticides along with cultural practices. Dithane M-45 (Mancozeb 75% WP) was mostly used fungicide. Farmers were not conscious about the harmful effects of pesticides and its consequences. Nineteen percent were found using mask, gloves and apron as protective measures while application of pesticides. Source of pesticides was from Agro-vet, retailer and co-operative (52 %). The study revealed that irrigation and absent of quality seed were the major problem observed in the study area.

Evaluation of wheat genotypes against yellow rust

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A study on wheat genotypes against yellow rust (YR) was conducted to know its prevalence in farmer's field. Varietal evaluation was carried out in research fields of NARC, Lalitpur. Different nurseries were evaluated according to Modified Cobbs Scale. Four hundred thirty three genotypes received from wheat disease screening nursery (WDSN), 280 genotypes received from rust screening nursery (RSN), 20 genotypes received from rust trap Nursery (RTN), 19 genotypes of Near isogenic lines (Nils), 110 genotypes from international disease trap nursery (IDTN) and 50 genotypes received from wheat varietal display (WVD) were evaluated for YR during 2015-16. In WDSN, out of 433 genotypes, ninety three (21.4%) of wheat genotypes in 1st score and nine (2.0%) genotypes in 2nd score had shown high severity of YR infection. Out of 280 entries from RSN, forty (15.3%) genotypes were found with high severity of YR disease in 1st score and eleven (3.9%) genotypes in 2nd score had shown high severity of YR infection. Out of 20 entries from RTN, One (5%) genotypes were found with high severity of YR disease in 1st score and no genotypes in 2nd score showed high severity of YR infection. Nils 3 (15.7%) genotypes were found with high severity in 1st score and 2nd score revealed that 3 (15.7%) genotypes had high severity of YR infection. Out of 110 entries from IDTN, 42 (38.1%) genotypes were found with high severity of YR disease in 1st score and 21 (19%) wheat genotypes in 2nd score had shown high severity of YR infection. Similarly out of 50 entries from WVD, eight (16%) genotypes were found with high severity of YR disease in 1st score and 1 (2%) genotypes in 2nd score had shown high severity of YR infection. Among the diseases of national importance YR was found to be the most common disease in mid-hills.

Growth, yield, post harvest shelf life and soil Nnutrient status of coriander (*Coriandrum sativum*) under integrated plant nutrient management

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The present investigation on growth, yield, post harvest shelf life and soil nutrient status of coriander (*Coriandrum sativum*) under integrated plant nutrient management (IPNM) was undertaken in the farmer's field at Balkot, of Bhaktapur District, Nepal during the month of November to February. The experimental plots were subjected to

7 treatments as T₁ [1/2 NPK + FYM (12 ton/ha)], T₂ [3/4 NPK +FYM (6 ton/ha)], T₃ [1/2 NPK + vermicompost (3 ton/ha)], T₄ [3/4 NPK +vermicompost (1.5 ton/ha)], T₅ [1/2 NPK + Poultry manure (2 ton/ha)], T₆ [3/4 NPK +poultry manure (1 ton/ha)] and T₇ [farmers practice (control)]. The experiments were laid out in a randomized complete block design (RCBD) with replication 3. The maximum plant height was observed intreatment ½ NPK + FYM (12 ton/ha) [T₁] while maximum number of leaves and maximum yield per plot was observed intreatment 1/2 NPK + Poultry manure (2 ton/ha) [T₅]. The maximum shelf life of plant at room temperature was found intreatment ½ NPK + vermicompost [T₄]. The optimum pH value and organic matter was found intreatment ½ NPK + Poultry manure (2 ton/ha) and ½ NPK + FYM (12 ton/ha) [T₅ and T₁] respectively. Likewise, the maximum NPK content were found in treatment½ NPK + poultry manure (2 ton/ha) and ½ NPK + vermicompost (3 ton/ha) [T₅ and T₃] respectively.

Poverty and food security status of dalit community in five VDCs of Mugu District, Nepal

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This study was conducted from January to March 2017 with an objective to assess situation of food security and poverty of Dalit people in Mugu District. A survey was done from forty households which were selected randomly from five VDC (Shreenagar, Karkiwada, Rugha, Rowa, Pina. Data were collected using a questionnaire on cereal production, annual income, assets holding, occupation, health and sanitation facilities etc. Underemployment labor force, dependency on outsiders land, low income, poor health and sanitation facilities joint family and poor access to resources were found as major characteristics of Dalit people. Dalit's existing production systems were not sufficient for sustaining their livelihoods. None of the Dalit households (HH) were food secure, only 2.5percent HH had food for 9-11 months. Dalit peoples having higher land size in an average of 1.72 ha, living in joint family and with irrigation facility were found more food secure than others. Tradition of working as a slave, less land holding, traditional agricultural system leads to food insecurity. Annual in come of majority of Dalit HH were found less than NRs 10,000. Forty percent from HH was found doing carpentering as major source of off farm income. Most of the HHs 90 percent was using public tap and river for fetching drinking water whereas only 10 percent of the HH were using private tap. 90 percent HH were found using permanent toilet while 10 percent HH used temporary toilet.

Dalit people in Mugu have fewer potentialities to produce food crops with their less land and irrigation facilities. Also there is lack of resources to them. The poverty and food insecurity exist in Dalit peoples can be reduced if some efforts will be made from government and concerned agencies focusing on improved farming practices, livestock keeping, irrigation facilities and better utilization of food grains.

Effects of various organic manures on soil composition, growth and yield of broad leaf mustard

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This study was conducted in farmers' field at Bigam, Dakshinkali Municipality of Kathmandu during October 2016 to February, 2017 to study the effect of different organic manures (OM) on growth and yield of broad leaf mustard as well as on soil nutrient status. There were 5 treatments with 3 replications laid out in randomized complete block design. Treatments applied were farm yard manure (FYM) at 24t/ha (T₁), vermicompost at 6t/ha (T₂), poultry manure at 4t/ha (T₃), compost at 12t/ha (T₄) and control (farmer practice) T₅. There were significant difference in yield per plant, yield per plot and yield per hectare. Maximum yield per plant (0.129Kg/plant), maximum yield per plot (3.874K/plot) and maximum yield per ha (7.747t/ha) was obtained from T₂. However maximum plant height (38cm), maximum plant canopy (0.0591m³) and maximum leaf size (875cm²) was recorded from T₂. Maximum number of leaves was recorded in T₂ and T₄ with 12 leaves in each and maximum shelf life was recorded in T₂ with the value 8. Maximum pH value (7.2) and maximum OM (4.26%) was obtained in T₁ and T₄ respectively. Similarly, the highest available nitrogen (217.03 kg/ha), available phosphorus (119.367 kg/ha) and available potassium (431.586 kg/ha) were obtained in T₃, T₂ and T₁, respectively.

Effect of organic nutrient management on growth and yield of (*Beta vulgaris*) and its residual effect on soil

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Effect of organic nutrient management (ONM) on growth and yield of Bbeetroot (*Beta vulgaris*) and its residual effect on soil in HICAST Intregrated Farm, Badegaun, Lalitpur was carried out from November 2016 to March 2017. The experimented plots were subjected to five treatments viz, FYM (T₁), vermicompost (T₂), poultry manure (T₃), compost (T₄), T₅ control (farmer's practice). All treatments were applied in

November 2017. The experiment was laid out in a randomized complete block design (RCBD) with three replications. Data analysis was done through MS-Excel and Genstat. Maximum plant height, root diameter, root weight, yield per plot and yield per hectare were observed in treatment poultry manure (T₃). The maximum number of leaves, root length and organic matter was observed in treatment vermicompost (T₂). Similarly, available soil nitrogen, phosphorous and potash content was observed in treatment poultry manure. The study revealed that poultry manure is the best organic manure for cultivation of beetroot.

Production practices, marketing and problems in broad leaf mustard cultivation in Bhaktapur District

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A study on production practices, marketing and problems in broad leaf mustard (BLM) (Rayo) cultivation in Bhaktapur District" was carried out from December 2016 to March 2017. Hundred farmers from Madyapur Thimi Municipality and Anantalingeshwor Municipality were selected and interviewed with the help of a questionnaire. Socio-demographic study revealed that more number of male farmers (65%) was found involved in production activities of BLM. Majority (40%) of the respondents house had 1-2 ropani of land. Only 30% of the respondents had short term training vegetable cultivation. The cost of production of BLM in the main season was NRs. 35,703.12 per ropani (0.05 ha.). The average yield of Rayo was 1430.35 kg per ropani. The average farmgate selling price of Rayo was NRs. 38 per kg. Gross return from the BLM production was NRs.54,353 per ropani. The net return was NRs. 18,650.18 per ropani and an average B/C ratio was 1.522. The major problems faced by the respondents were lack of irrigation, technical support, unavailability of inputs, efficient market, collection center; disease and pest problem and involvement of middle men etc.

Assessment of potato clones for yield and yield attributing characters in NPRP Farm, Khumaltar, Lalitpur

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Sixteen clones of potato were evaluated in an exploratory trial for their yield and yield attributing characters such as late blight (*Phytophthora infestans*) and red ant (*Dorylus*

orientalis) insect pest resistant /tolerant at NPRP Farm, (1380 masl) Khumaltar, Lalitpur. Clones were planted in single row at the spacing of 60 cm between rows and 25 cm between plants with the application of FYM 20 t/ha and N:P2O5:K2O 100:100:60 kg/ha. Among the tested clones, clone CIP 397079.26 showed highest yield (40 t/ha) followed by CIP 311209.7 (39.44 t/ha). Among sixteen clones under study, CIP 397079.26 was observed resistant to late blight and red ant insect pest. Considering yield and late blight score value CIP 397079.26 was found superior.

On-farm incidence of cabbage aphid (*Brevicoryne brassicae* L.) in Salyan District on performance of cabbage variety

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A study in incidence and on-farm management of cabbage aphid *Brevicoryne brassicae* L. and on performance of cabbage genotypes against the pest was carried out in Salyan District. The study consists of two phases, one in research conducted in Khumaltar, Lalitpur and another field survey conducted at Salyan District. The research was conducted during December, 2016 to February, 2017. During the two scorings, Green Voyager variety was found to be not resistant to cabbage aphid with an average score of 2.01 and 2.625 respectively. Omphalos and Green Challenger varieties were highly infested by aphids on average. The analysis of yield showed the highest yield in Wonder Ball with an average yield of 40.39622 ton/ha. It was followed by Omphalos, Green Challenger, Green Voyager and Green Coronet with average yield of 37.6529975, 37.4610675, 35.8740675 and 29.47408 ton/ha respectively. The survey was conducted to observe the incidence and on-farm management of cabbage aphid in Salyan District on January, 2017. It was found that the cabbage fields were infected with insect pests in more amount (68%) than diseases (32%). Among the diseases, damping off was found to be the most devastating disease. Among the insect pests, cabbage aphid had the highest incidence. The percentage incidence of cabbage aphid was found to be 68% on average. The severity index showed that the severity was relatively low (1.96). Among the management methods adopted, majority of the farmers (45%) used chemical method of aphid management, with minority using cultural and biological methods of pest management.

Production and marketing of Jhapali Malbhogin Chitwan District

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A study on production and marketing of Jhapali Malbhog in Chitwan District was conducted from January to April 2017 at Padampur and Ratnanagar Municipalities in Chitwan District. Sixty farmers were randomly selected, of which 35 were from Padampur and 25 from Ratnanagar area. Socio-demographic study showed that male 68% and female 32% were involved in banana farming. Majority of the farmers (58%) had small land holding size of 0.1-1 ha and the bananas were marketed through the post harvest contractors. Agriculture was the primary occupation for 62 percent of the respondents. Very few respondents (2%) were found practicing intercropping. Farmers did not do propping in their banana orchards. Irrigation was major problem faced by the respondent farmers (55%), yet majority of the respondents (43%) were attracted to banana farming due to the higher level of income. About 68 percent of respondents preferred planting density of 1800 plants per hectare. All of the respondents used suckers from their nearby relatives as a source of planting material. Regarding the pest and disease problem, Panama wilt was the most serious disease threatening the banana cultivation. The post harvest contractors were the major actors in the marketing channel. It was found that 25 percent of the respondents had insured their farms. No respondents had the facility of storage of the banana. Due to this they are compelled to sell their banana to the post harvest contractors at their price. Farmers were suggested to use the tissue cultured suckers.

Effect of packaging materials on post-harvest loss of apple

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The experiment was conducted during February-March, 2017 to study post harvest loss of apple (*Malus domestica*) under different packaging material. Four packaging materials namely jute sack, nylon sack, carton paper, carton paper with foam net and a control treatments were used. Completely randomized design with four replications was used in the study. Physical attributes including shelf life, weight loss, pathological disorder, total soluble solid, decay incidence and marketability were assessed at seven days interval. The carton with foam net was found best as it lowered transpiration and moisture loss rate and increased shelf life of fruits up to 46.25 days. Weight loss was maximum in control treatment followed by nylon sack packaging and carton paper

packaging. The percentage of fruit spoilage was higher in carton paper packaging and nylon sack packaging during initial weeks but in the last week of observation, spoilage rate was found higher in jute sack packaging followed by control treatment. Marketability was higher up to 21 days in carton with foam net followed by jute sack packaging and control treatment. The fruits with nylon sack packaging and carton paper packaging were severely affected by the pathogens causing blackish color in the fruit samples. Minimum amount of TSS was recorded in jute sack packaging up to 49 days of storage followed by control treatment.

A study on coffee leaf rust and farmer's management practices in Lalitpur District

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A study on coffee leaf rust (CLR) and farmer's management practices in Lalitpur District was conducted from February to April, 2017. A total of 80 respondents were interviewed randomly from 5 different VDCs of Lalitpur District. The major problem faced by the farmers in the field was diseases (60%) followed by the infestation of insects (35%). Among the diseases, CLR was found to be the most damaging disease (80%). Among the insects, White stem borer was found to be infested in the field in maximum amount (91%). The average disease incidence was found to be highest in Thuladurlung with disease frequency of 71 percent. The lowest disease incidence was found in Gimdi VDC with disease incidence of 57.5 percent. While calculating the disease intensity (DI) on the scale 1-4, the disease intensity was found to be 2.65 on an average. The DI was found to be similar in almost all VDCs. However, it was slightly higher in Gimdi VDC with a score of 2.52. The lowest disease intensity was in Pyutar VDC with a score of 2.22. Most of the respondents (79%) used Bordeaux mixture, while some of them used shading plants. Some of them said that the varieties used were comparatively resistant to CLR than other farmers. Among the 80 respondents, 48% of them had received training on CLR and about remaining respondents had not attained training which was conducted by HELVETAS in coordination with DADO, NARC, NTCDB, and PPD. The study showed that the farmers lacked cultural practices in the field. The use of organic manures, essential nutrients and biological control agents in the coffee field were found to be nil. There was the lack of field studies on CLR in Nepal.

Postharvest losses of organic apples in Jumla

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The study was carried out in two VDCs of Jumla to find out problems of organic apple production, harvesting methods, storage facilities and suitable packing materials from January to April 2017. In the study 100 respondents were taken by using simple random sampling method. Majority of the apple growing farmers did not pre-cool the apple after harvest which led to fast deterioration of the product. Apple tree in Jumla were severely infected with many diseases and insects for which no proper control measures were applied. Only few farmers used Bordeaux pest and mixture for controlling insect pests and disease. FYM was the main source of the nutrients, only a few farmers use compost and Jholmal. Training on pruning systems were adopted by some of the farmers due to lack of knowledge and skill manpower. Farmer in Jumla had been doing apple grading in several ways such as by colors, size and shape. Due to the high cost of cushion materials 57 percent of the respondents used chopped straw which is easily available in their house. Most commonly used storage system was an ordinary storage. That was used by 59 percent of the respondent farmer in Jumla. Bamboo basket (doko), jute sack, plastic, cartoon were used by the farmers to pack apples. Due to the rough road condition and vehicles used the transportation loss by physical pressure was higher than physiological changes. Due to lack of proper knowledge of post harvesting handling technology there was huge loss of apples indifferent activities such as during harvesting 17%, grading 9%, transportation 30%, marketing 18%, and at storage 26 percent.

Sustainable livelihood improvement of marginalized people of three VDCs of Makwanpur District through organic vegetable farming

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A survey on sustainable livelihood improvement of marginalized people through organic vegetable farming in 3 VDCs of Makwanpur District was conducted to study the livelihood of marginalized farmers adopting organic farming. This study was based on the inductive approach; qualitative design. Study was conducted among 100 respondents. There was significant contribution made by the organic agriculture to

improve the socio-economic status of farmers. Farmers were attracted towards organic vegetables production because of less input cost and low pesticides exposure however, the productivity was found to be less. Moreover, according to the farmers, consumers were not concern about the organic produce and harmful effects of inorganic vegetables. Eighty three percent of farmers were in profit who practiced organic agriculture. This revealed that adoption of organic farming system was economically profitable and was found making significant contribution to the reduction of food security and inthe improvement of sustainable livelihood of the farmers. The study also illustrated that major problems faced by the respondents were lack of proper market, no storage facilities and low price for organic products. After switching into organic farming system, majority of the respondents improved their child education, health of the family, availability of nutritious food and savings. Inthis District, if good government policies are made, if farmers follow profit gaining marketing channel and availability of inputs inminimum cost are made then organic farming system can intensely flourish.

Efficacy test of bio-pesticides in management of clubroot disease

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Clubroot (*Plasmodiophora brassicae*, Woroni) causes soil borne disease, transmitted through contaminated soil, water, plant parts, and agricultural tools. A survey was conducted in infested field at Bhaktapur District to know the clubroot disease (CD) status and management practices followed by farmers. Survey data revealed CD incidence was higher than 50% inthe District; farmers practiced the use of Nebijin (80%), Sanjeevani (20%) and crop rotation (8%). After harvest of vegetables, majority of farmers left infested plants parts by CD in their field, few of them bury it or mix it in compost making. Field experiment was conducted for efficacy test on management of CD by the use of four bio-pesticides viz. Jadibuti (New Botanical from Bajura), Jaivik, Biocide-Trivi (*Trichoderma viride*), Guard (*Pseudomonas fluorescens*) and untreated control. The result revealed that there was no remarkable effect of the treatments in mean leaves number as well as height of plants compared to control. Treatment effects showed significant difference on disease severity but not in disease incidence. However, all the treatments were at par in their efficacy. Among the treatments *T. viride* was found best in reducing CD incidence by 20% followed by Jadibuti and *P. fluorescens* both by 15%. Similarly, CD severity was found to be reduced by 34% with Jadibuti then by *T. viride* (29%) and *P. fluorescens* (28%).

Regarding yield, no significant difference was seen with the control but value of fresh biomass weight was higher in *T. viride* (8kg/plot) than that of control (3.79 kg/plot). Farmers need awareness regarding management practices. *T. viride* and Jadibuti were found better in reducing disease severity while Jaivik can be used as one of the tools in combination with other IPM tools for additive effect. Jadibuti could be one of the effective botanical treatments to reduce CD, however its efficacy need to be further verified in the field.

Production practices and problems of ginger farming in Garpa VDC and Sharada Municipality of Salyan District

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A study on production practices and problems of ginger farming in Garpa VDC and Sharada Municipality of Salyan District” was conducted from January to April 2017 to examine the existing production practices and problems of ginger farming in those areas. Randomly selected 45 respondents from Sharada Municipality and 25 from Garpa VDC were interviewed. Almost 66 percent of the respondents were males and 34 percent were females with an average age of 45 years. Agriculture was the primary occupation of 74 percent respondents. Almost 66% of the respondents had history of ginger cultivation for more than 12 years and 56% were practicing ginger cultivation due to suitable climate and more earning. Almost 66% respondents produced planting materials (ginger rhizomes) by themselves. Local varieties namely Bose and Nase were used by 60% and 34% respondents respectively and 65 percent farmers did planting before monsoon. Ginger was mostly intercropped with chilli, turmeric and beans. None of the respondents had irrigation facility in the study area. Only 2% were found using chemical fertilizers. Lack of irrigation was the major problem. Due to lack of processing center 79% respondents processed ginger into Sutho (dried ginger) traditionally. Rhizome rot was the most serious disease and white grub was found as devastating insect pest in the study areas. The respondent farmers were found to store ginger traditionally in pits under shades. Most of the respondents were not found in direct contact with consumers. Consequently middlemen/traders were found active in marketing of ginger. Except some constraints and problems most of the respondents had positive attitude towards ginger cultivation. The benefit cost ratio of ginger production was approximately 1.33. Government support is needed to upgrade ginger farming and its marketing in national and international markets.

Management of insect pest of cauliflower using different ecofriendly pesticides in Kathmandu Valley

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The study on management of insect pest of cauliflower using ecofriendly pesticides in cauliflower of Kathmandu, Lalitpur and Bhaktapur districts was done. A household survey was conducted with the random sampling method and interviewed with semi-structured questionnaire among 50 respondents. Majority of farmers used chemical pesticides in vegetable crops for management of insect pests. Diamondback moth was found to be a major pest. A field experiment was conducted to assess the efficacy of different botanicals against insect pest of cauliflower. Experimental plot was designed in Randomized Complete Block Design (RCBD) under five treatments and 4 replications. The treatments were homemade bio-fertilizer (T1), Gitimal (T2), Bajura pesticide (T3), cow urine (T4) and Control (T5). From the experiment it was found that T1 has causes more impact on height of plant (25.09 ± 10.71) and number of leaves (11.75 ± 1.95). Similar trend of impact was revealed in canopy of cauliflower crops with the application of T2 (29.59 ± 9.41) and T1 (29.39 ± 12.9). Bajura pesticides showed highest reduction of insect pest population after first spray (7DAT = 85.82 %, 14DAT = 66.35), second spray (7DAT = 93.92 %, 14DAT = 74.03%) and third spray (7DAT = 96.71%, 14DAT = 92.70%). Similarly, another field experiment was carried out with the different concentration of T3 to assess the appropriate dose of pesticide to apply in RCBD with 5 treatments and 4 replications. Treatments were in concentration of 1:5 and 1:10 at 7 days and 14 days interval which were indicated as 1:5 at 7 days (T1), 1:5 at 14 days (T2), 1:10 at 7 days (T3), 1:10 at 14 days (T4) and control (T5). 1:10 at 7 days was found more effective against insect pest compared with other treatment.

Major insect pests in cauliflower and their management practices in Kathmandu District

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The study was conducted on major insect pest of cauliflower and their management practices in Dahachowk, Macchagau, Thankot and PuranonaikapVDCs of

Kathmandu district. Samples of 40 respondents were selected randomly and information was collected from the semi - structured questionnaire. Seventy seven percent of the respondents were male and 23 percent were female. Out of total respondents 20 percent were illiterate and 80percent were literate. The incidence of diamond back moth (DBM), cabbage aphid, white fly and cabbage butterfly were in greater number than other pest. DBM was found in almost all fields similarly cabbage aphid and white fly were also seen. Damage caused by DBM was 50 percent followed by aphid 30 percent, cabbage butterfly 10 percent, white fly 5 percent and others 5 percent. The major diseases found are club root and damping off of seedling. Most the farmers use chemical pesticide for the management of insect pest. Many training and seminars were conducted in those areas by different organization, as a result only 40 percent of the respondents involved in training. Only 20 percent of the respondents have clear knowledge on integrated pest management system. Other 80 percent of the respondents were completely unknown about integrated approach of management. Forty five percent respondents were using chemical pesticide controlling insect pest and 30 percent of the respondents were using combined chemical as well as cultural method for the management of insect pest and 10 percent were using botanical pesticide and remaining 15 percent of the respondents were using none of them. The indiscriminate use of chemical pesticide has resulted pest resistance, resurgence. Most of the farmer prefers to use chemical pesticide due to lack of knowledge and information of bio- pesticide. Some farmers use botanical pesticides like Azadiractin, Margosom, jholmaal, and cow urine for aphid control.

A study on efficacy of IPM practice over farmer's practice in Kathamndu valley

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A study on efficacy of IPM practice over farmers practice was done. Six farmers group were selected from Kathmandu, Bhaktapur. Field experiment was carried out in Tinpiple of Kathmandu district by making two different plots for IPM and farmer's practice, ten plants per plants were selected as sample plants and observation was done for growth, yield and crop protection strategies. More than ninety percent of farmers reported, pest infestation and its loss was higher before the adoption of IPM and Late blight of tomato and potato was found as a highest occurring disease followed by Damping off of Cole crops. Before IPM training the percentage of

respondents who were using the crop rotation, intercropping, botanical pesticides, bio-pesticides, hormones and integration of more than one techniques were 14%, 34%, 8%, 5%, 2%, 10% respectively whereas, the percentage of farmers increased significantly to 72%, 80%, 88%, 55%, 58%, 85% respectively. Maximum plant height (39.06cm) and maximum increase in plant canopy 530.2 percent was observed in IPM practice at 75 DAT while at the same time plant height and increase in plant canopy in farmer's practice was 27cm. and 312.2 percent respectively. The average yield of a cauliflower was 38.88 tons per ha in IPM practice whereas in farmer's practice that was only 23.33 tons per ha. Maximum number and type of beneficial insects including Ladybird beetles, predatory wasp, spiders, and dragonfly were observed in IPM practice as compared to farmer's practice. Maximum number of Aphids (14 insects per plant) and DBM (5 insects per plant) were observed in IPM practice whereas in farmer's practice aphids were reached to 45 insects per plant and that of DMB reached to 6.5 insects per plant. Despite off some farmers in the study area, most of respondents were found to be attracted towards IPM practice in Kathmandu Valley.

Comparative study on potato cultivation under IPM and conventional farming system in Kavrepalanchowk District

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A comparative study on potato cultivation under IPM and conventional farming system was conducted from November 11, 2016-April 11, 2017 in Kavrepalanchowk District. The objective of the study was to compare production status of potato production under IPM and conventional system. Sixty households were practicing integrated pest management (30) as well as conventional (30) farming in their land was covered. During survey primary data were gathered using semi-structured questionnaire and secondary data were collected from different sources like books, reports, research paper. Potato was the major vegetable and it was grown by adopting IPM and conventional methods. Female percent of respondent was high in IPM than in conventional. In conventional farming 57% of farmers were farming on leased land and 43% on own land. In IPM 72% of farmers were farming on own land and 28% on leased land. In conventional method, farmer use chemical fertilizers like Urea, DAP. Murate of potash and the fertilizer used in IPM are less amount of Urea, DAP, MOP and more amount of chicken manure, Farm yard manure etc. Conventional farmers (61%) were applying the chemical pesticides haphazardly in their fields without knowing the appropriate dose of the pesticide. Farmers were found applying pesticides

during day time on IPM 5% and in conventional 50%. Main attraction toward IPM was low pesticide exposure to farmer and attraction toward conventional was due to high profit. In conventional most of respondents faced problem like allergies, vomiting, and diarrhea. The high productivity was seen in conventional than IPM practice. The study revealed that most of respondent had future plan toward integrated pest management. Benefit cost ratio of IPM was 1.87 and that of conventional was 1.70. Lack of quality seed, disease and pest prevalence were the major constraints found in the study area.

Assessment on major diseases of broad bean in farmer's field and research station at Kathmandu Valley

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A study on assessment on major diseases of broad bean in farmer's field and research station in Kathmandu Valley was conducted. Disease scoring was carried out for 10 different genotypes with 3 replications using RCBD design. Scoring was conducted for five times from the end of January to first of April at an interval of 15 days. Similarly, disease scoring was performed in farmer's field using simple random sampling technique. Fifty respondents were selected from three districts of Kathmandu valley. Data were analysed using MsExcel and Genstat. In all three districts the major diseases prevalent were chocolate leaf spot, rust and early blight. Disease infestation level varied from place to place. Severity of rust was much pronounced in Kathmandu (Kritipur). Infestation of chocolate leaf spot and early blight was much high in areas of Kathmandu and Bhaktapur. In most areas, the variety cultivated was local. Disease scoring values among different genotypes were progressively increasing from 1st to 5th observations at HRD of NARC. Scoring value for early blight was high compared to the chocolate leaf spot. In genotypes like HRDFB013 and HRDFB014 value had increased from 3.9-6.7 and 3.6-6.76 respectively from 1st to 5th, indicating the genotypes were slightly susceptible to moderately resistant for early blight. Similarly in HRFB013 and HRDFB002, value for chocolate leaf spot had increased from 2.06-5.06 and 1.6-4.5 respectively, indicating both these genotypes were moderately resistant to chocolate leaf spot disease. Comparative study on cultivation practices between farmer's field and research station showed huge differences. Most of the farmers have cultivated broad bean in much neglected manner without performing proper sanitation, land preparation, manuring, weeding and hoeing and some even grow it for utilization of fallow land. The severity of rust was pronounced in some field resulting 70 percent of yield loss that was almost negligible in research station.

Earthworm growth performance in different soil and organic manure ratio

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An experiment was conducted at Nepal Agricultural Research Council (NARC), Khumaltar, Lalitpur from November 2016 to May 2017 aimed to find out the earthworm growth performances in different soil to organic residue ratio. Five treatments of organic residue and soil in different combination were replicated three times using the Complete Randomized Design (CRD). The treatments were 100% banana stem (T1), 100% soil (T2), 50% FYM and 50% soil (T3), 75% FYM and 25% soil (T4) and 90% FYM and 10% soil (T5). Forty earthworm species (*E. fetida*) were put in a plastic basin with eight kg of each soil: organic residue ratio. Among the different combinations of soil and organic residues used, T3 (50% FYM and 50% soil) was found statistically superior to increase population and cocoon production than all other treatments during the experiment. Earthworm population was begun to increase in increasing rate only after the winter and dry season. And total weight of earthworm was also found higher in T3. Level of NPK was found to be higher in the higher level of FYM in the treatment T4 and T5. Highest level of total NPK was found in T3. The pH level was higher in T3 in comparison to the other treatments. Overall the combination of 50% FYM and 50% soil gave the best significant result. So, this result indicate the possibility of using soil as earthworm feed which may help to reduce the shortage of feed and helps to reduce the farm cost.

Production practices, problems and income generation from leafy vegetable crops in Manohara VDC, Bhaktapur District

Bibek Kumar Yadav

A study on production practices, problems and income generation from leafy vegetable crops in Manohara VDC, Bhaktapur District was conducted during January to May, 2017 by using research tools such as semi structured questionnaire, interview, key informant discussion and direct observation. The total numbers of respondents were 100. The farmers in the study area produced different types of leafy vegetable crops among which broad leaf mustard (BLM), spinach, cress, fenugreek and mustard leaf were the major ones. The farmers engaged in leafy vegetable farming were 52.40

percent male and 47.60 percent female. Eighty four percent of the respondents were found to be literate and 16 percent of the respondents were illiterate. The age group between 36-45 years was maximum involved in the leafy vegetable farming in the study area. Majority of the respondents had total land holdings of 4-6 ropani for leafy vegetable production. Almost 74% of the respondent farmers had their own land for leafy vegetable arming and 26% respondent had leased land. Majority of the respondents (about 42%) had monthly income of NRs.5000-10,000 per ropani per month. The average yield of BLM was 7.5 ton/ropani, spinach 6.1 ton/ropani, cress 3.9 ton/ropani and fenugreek 4 ton/ropani in the study area. The major problems in the study area were lack of labor, irrigation, agricultural inputs and technical skills for leafy vegetable farming.

2.VETERINARY SCIENCE

Prevalence of fasciolosis among cattle in Kavrepalanchowk District

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A study on the prevalence of fasciolosis in cattle of Kavrepalanchowk District was conducted from January to April 2017. A total of 130 faecal samples were collected from cattle of Janagal, Mayaltar and Nasikasthan and transported in a coolbox to Mobile Veterinary Hospital, Jawalakhel, Lalitpur. Faecal examination was carried out by performing sedimentation method. On microscopical examination of faecal sample 26.92% (35/130) was found to be positive for *Fasciola*. Location wise prevalence was 22.5%(9/40) in Janagal, 22.91%(11/48) in Nasikasthan and 35.71%(15/42) in Mayaltar. The prevalence of *Fasciola* was found to be 20.68% (6/29) in 0-2 years of age, 27.27% (12/44) in 2-4 years of age and 29.82% (17/57) in above 4 years of age. The breedwise prevalence was 27.11% (32/118) in Jersey and 25% (3/12) in Holstein Friesian. Similarly, sexwise prevalence was 40% (6/15) in male and 25.21% (29/115) in females. The prevalence of fascioliasis was found to be 23.07% (24/104) in stall fed cattle compared to 42.30% (11/26) in semi-stall fed cattle. The statistical value showed no significant difference ($p>0.05$) in location wise prevalence of fasciolosis. The sex wise prevalence and breedwise prevalence were analysed through Fisher's Exact Test which showed probability value greater than 5% which indicated that there was no significant difference between different values of sex and breedwise prevalence. There was significant difference ($p<0.05$) in prevalence of fasciolosis among semi grazing and stall fed animals which may be due to presence of snail population in the grazing area.

Detection of antibiotic residue in milk samples of Kathmandu District

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The present study was conducted at laboratory of Veterinary Standards and Drug Administration Office (VSDAO), Department of Livestock Services, Budhanilkanta, Kathmandu. It was carried out during the month of February to April, 2017 in semi-urban areas surrounding the Kathmandu District. A total of 106 raw milk samples

were collected from 11 different sites of Kathmandu District (Tokha, Nepaltar, Goldhunga, Sitapaila, Nagarjun, Ramkot, Gaushala, Guheswori, Gothatar, Mulpani and Hatidhada) with the aim of determining the prevalence of antibiotic residues (tetracycline, sulfamethazine, streptomycin, gentamicin, penicillin and fluoroquinolones) in those samples. Two types of antibiotic residue analysis test kits were used in this study namely Rapid Residue (RR) test kit and Rapid test kit which were available at VSDAO. The prevalence of antibiotic residue was found to be 11.32% (n=12) of the total of 106 samples collected. Out of the total samples 1.88% (n=2) were found to contain gentamycin residue, 2.83% (n=3) were found to contain Sulfonamides and 0.9% (n=1) were found to contain Streptomycin. Quantification of the antibiotic residues could not be carried out. The study has indicated a clear risk involved in the consumption of dairy milk with antibiotics residue. Therefore, it is vital that all inspection controls are to be strengthened and monitor records on the treatment of animals as well as following duration of withdrawal period for different antibiotics and proper use of antibiotics.

A pilot study on clinico-efficacy of ivermectin in treatment of mange / mites in dogs of Kathmandu District

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This study was done to find out the efficacy of ivermectin treatment of mange/mites with the aim of finding out effective and economic way of treating the mange/mites in dog. This study was conducted at laboratory of AHRD, Khumaltar, Lalitpur, HICAST Veterinary Hospital, Sitapaila, Kathmandu and Divine Veterinary Clinic, Sinamangal, Kathmandu during the month of February to April, 2017. A total of 40 deep skin scrapings samples and 10 blood samples were collected from different sites, Sinamangal, Tokha, Baneshwor, Sitapaila, Chobhar, Jadibuti, Kandaghari. The clinical cases of dogs were divided in to two groups of animals were taken among which one group of dogs were administered with Ivermectin @ 1mg/kg and in another group @ 2mg/kg subcutaneously. Examination of skin scrapping and biochemical parameters tests (ALT, AST, ALP, Creatinine, BUN) (Erba, CZ) were conducted before and after the Ivermectin injection to find out the liver and kidney function. During this study, double strength of Ivermectin (2mg/Kg BW) injection was proved to better than single strength (1mg/Kg BW) in terms of economy, time consumption and toxic effect to the Liver and Kidney. However, the healing of the skin lesion was better in the single strength. This study also indicated that there was no significant

difference in healing of the lesions ($p > 0.05$) based on associated factors like sex, age, breed and management which suggested pharmaco-dynamics and pharmaco-kinetics of ivermectin was not affected by any of those factors. Yet there was no significance difference in biochemical parameters between single and double strength regime ($p > 0.05$) except in the BUN ($p < 0.05$) where p value was 0.02. This study showed double strength of ivermectin was found to be superior to the single strength. This study can change the perspective of clinician in way of their treatment for it being more economic. Since, Iivermectin sensitive breeds of dogs couldn't be included in this study, the role of ivemectin in those groups of dogs was inconclusive. Hence, further study on this topic is necessary in near future.

Seroprevalence of major poultry diseases (mycoplasmosis, IB, Nd and avian influenza) in selected poultry farms of Bhaktapur District

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A study on seroprevalence of major poultry diseases (Mycoplasmosis, IB, ND and avian influenza) in selected farms of Bhaktapur District was conducted from March to May 2017. In the present work, profLOK MG ELISA (Symbiotics USA) and dot-ELISA (Biogal, Israel) kit were used for screening 135 poultry sera samples of commercial layers (65) and broilers (70) against mycoplasmal antibodies. Test results revealed prevalence of mycoplasmosis as 49.8% in layers and 72.0% in broilers with the average prevalence of 60.9% on ELISA test, while 40% (4/10) and 70% (14/20) seroprevalence for layers and broilers, respectively on dot ELISA (immunocomb) with the overall of 55.0%. In addition, 10 serum samples were screened for infectious bronchitis (IB) – Newcastle disease (ND) – infectious bursal disease (IBD) on dot-ELISA kit test and the results showed that IB was negative for all the samples. ND was positive antibodies for all samples whereas IBD was positive for only one sample, Similarly ELISA test on avian influenza A (ID Vet, France) antibodies revealed 79.55% (35/44) seropositive for layers and 81.25% (39/48) for broilers with overall prevalence of 80.40% (74/92) in poultry. The study has indicated the need of screening against major poultry diseases and further study is required to confirm any losses infarms due to these diseases.

Study of Gastro-Intestinal Parasites InEmus of Rupandehi District

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This study was carried out during the month of February to April, 2017 in oOstrich Nepal Pvt. Ltd., Gongolia-1, Rupandehi, Nepal. A total of 100 fresh fecal samples were collected with the aim of determining the prevalence of gastrointestinal parasites in those samples. Sedimentation technique of fecal examination was carried out to observe the parasites. An overall prevalence of parasites was found to be 26%. Out of the total samples 9% were found to be Nematodes, 17% were found to be Protozoa, trematodes and cestodes were found to be negative. There was no any significant difference according to the age wise fecal examination. On the questionnaire survey it was found that the emus reared in the farm were kept confined. The water provided for drinking was not purified nor were any deworming and routine fecal examinations regularly conducted. This study on emu should be conducted on regular basis and necessary prevention and control measures to be taken for safe production.

Prevalence of intestinal helminth parasites in Pakhribas Black Pigs

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A prevalence study was conducted during January to April 2017 to find out the occurrence of intestinal helminth parasites in Pakhrbas Black Pigs. A total of 110 fecal samples were collected that included 55 samples from pigs of organized farm of Agriculture Research Station (ARS) and 55 from unorganized farm of Pakhribas, Municipality. The samples were transported in cool box to Mobile Veterinary Clinic, Jawalakhel and laboratory examination of fecal samples was carried out by sedimentation method. The Overall prevalence of helminth ova was 42 (38.18%) with highest prevalence of *Ascaris sps.* 26(61.90%) followed by *Strongyle sps.* 16(38.10%). The present study concluded that pigs from unorganized farms were highly susceptible to parasitic infestation in comparison to pigs from organized farm. Pigs from organized farm showed 15(35.71%) prevalence while that from unorganized farm showed 27(64.29%), respectively. Thus the result of higher prevalence of helminth parasites in pigs of unorganized farm than of organized farm and its associated factors

were found to be depend on source of feeding, deworming practice sand the deworming intervals respectively.

Identification of *Salmonella* species in poultry meat with antibiotic sensitivity test (AST) of isolated organism in Kathmandu Valley

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The present study was conducted with an objective to find the prevalence of *Salmonella* in chicken liver along with their antibiotic sensitivity test profile from different sites of Kathmandu Valley. A total of 75 liver samples were collected then isolated and analyzed at Microbiology Laboratory of Animal Health Research Division, Khumaltar, Lalitpur from January 2017 to March 2017. Samples were identified as *Salmonella* by conventional microbiological method and antibiotic sensitivity testing was performed. Out of 75 liver samples analyzed, 34(45.33%) samples showed positive to *Salmonella* through biochemical analysis where positive reaction was shown for, XLD, BGA, TSI and Methyl red, 25(33.33%) samples showed other lactose fermenting bacterial species growth while other 15(20%) samples showed no growth on culture media. Out of thirty four positive samples 12 (35.29%) were found to be *S. typhi*, 9 (26.47%) as *S. enteritidis*, 12 (35.29%) as *S. cholerasuis* and 1 (2.94%) as *S. pullorum*. Out of 34 positive samples of the *Salmonella*, 34 samples were found to be motile while one sample was found non-motile in SIM test. Antibiotic sensitivity test was also performed by disc diffusion method. Out of 34 positive samples 13 samples (35.14%) showed sensitivity to ciprofloxacin, 11 of the sample showed intermediate diffusion and it was observed that all samples were resistance to ampicillin. Although all the meat shops had refrigerator facility to store the meat, the sanitation, hygiene, knowledge and practices of chicken handlers seemed to be very poor. Inorder to get good quality meat and meat products improvement inthe personal hygiene of workers, sanitation, knowledge and raising the level of awareness is needed.

A study on sub-clinical mastitis in dairy cattle of Dhulikhel and Banepa of Kavrepalanchok District

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This study was conducted to determine the prevalence of sub-clinical mastitis (SCM) in dairy cattle of Dhulikhel and Banepa of Kavrepalanchok District. Altogether 240 milk samples of 60 apparently healthy dairy cattle were collected in sterile plastic vials. Milk samples were examined by California Mastitis Test (CMT) and microbiological cultural examination. Overall prevalence of SCM was found to be 33.33% and 29.58% on animal and quarter basis respectively. The SCM prevalence was found more in RH quarter followed by LH, LF and RF quarters respectively and those differences were statistically significant ($P < 0.05$ i.e. 0.025). Similarly, 77.46% samples showed bacterial growth in microbiological culture of CMT positive samples. Gram staining examination of bacterial growth showed the presence of both, Gram positive as well as Gram negative bacteria. The Gram positive bacteria isolated were predominantly *Staphylococcus spp.* (43.66%) followed by *Streptococcus spp.* (29.57%) while the Gram negative bacteria isolated were *Escherichia coli* (38.02%), *Klebsiella spp.* (18.30%), *Enterobacter spp.* (5.63%). The isolates from the bacterial culture were further cultured in Mueller Hinton Agar (MHA) for Antibiotic Sensitivity Test (AST) to detect susceptibility of the isolated organisms. AST revealed that Gentamicin had the highest average sensitivity (95%) followed by enrofloxacin (82%), Tetracycline (75%), oxytetracycline (40%) and penicillin was found very least sensitive (5%). The highest prevalence of SCM was found in the Holstein cross cattle followed by Jersey cross and local cattle, however this finding was statistically insignificant ($P > 0.05$ i.e. 0.166). The major causative organisms of SCM found are *Staphylococcus spp.*, *Escherichia coli* and *Streptococcus spp.* Hence, suitable preventive and control measures against SCM should be carried out. Effective awareness programmes based on farm management, hygienic practices, sanitation, clean milk production for farmers are recommended along with operating mass screening tests to detect SCM at regular intervals to minimize the incidence of clinical mastitis.

Prevalence of *Toxocara vitulorum* in cattle and buffalo calves of Vyas Municipality of Tanahun District

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A study on the prevalence of *Toxocara vitulorum* in cattle and buffalo calves was conducted in the period of February to April 2017 in 13 different areas (Belbas, Patan, Bisghare, Baghvanjyang, Bairene, Kalasti, Chapaghat, Shage, Duipipple, Virkot, Nahala, Kamalbari and Ghansikuwa) of Vyas Municipality of Tanahun District. A total of 250 faecal samples were collected from 1-6 months old calves of cattle (100) and buffalo (150). Among 250 samples, 118(47.20%) were positive for *T.vitulourum* eggs, of which 37(37%) cattle calves, and 81(54%) buffalo calves were positive for *T. vitulorum* eggs. The present study showed that *T. vitulorum* egg is prevalent in bovine (cattle and buffalo) calves. Prevalence of *T. vitulorum* eggs in buffalo calves (54%) were more than cattle calves (37%). Similarly the prevalence of *T.vitulorum* eggs was more in young animal than older animal. The infection rate was 45.94% in 0-2 months old, 25.58% in 2-4 months old and 45% in 4-6 months old cattle calves. Similarly infection rate was 60% in 0-2 months, 60.86% in 2-4 months and 40.81% in 4-6 months old buffalo calves. Among 250 faecal samples, 83 samples were of males and 167 samples were of females. Out of 83 samples 44 (53.01%) was positive for *T.vitulorum* eggs in males and out of 167 samples 74 (44.31%) was positive for *T. vitulorum* eggs infemales. Male animals had higher prevalence than female animals for *T. vitulorum* eggs.

Sero-prevalence of salmonellosis in poultry of Kathmandu Valley

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A study was conducted from February to April 2017 to find the sero-prevalence of salmonellosis in poultry of Kathmandu valley by rapid plate agglutination test. A total of 150 serum samples were collected from commercial layers, commercial broilers and local poultry from Kathmandu valley. The history of layers, decrease in egg production and other symptoms related to Salmonella were collected. A total of 44% (66) samples were positive for antibodies against Salmonella by Rapid Plate Agglutination Test (RPT) which was statistically significant ($P < 0.05$). Two layers farms where the samples were collected had a history of salmonellosis in the

poultry. While comparing breed-wise prevalence the results showed that out of 50 samples of layers 48 (96%) samples were found positive, out of 50 samples of boilers 10(20%) samples were positive and out of 50 samples of backyard poultry 8(16%) samples were found positive. This study has proved the sero-prevalence of Salmonellosis in commercial layers, broilers and backyard poultry of different location of Kathmandu valley. A further study on isolation and identification of different species of Salmonella has been recommended.

Study on gastro-intestinal parasites in ostriches of Rupandehi District

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This study was carried out during the month of February to April, 2017 in Ostrich Nepal Pvt. Ltd., Gongolia-1, Rupandehi, Nepal. A total of 105 fresh fecal samples were collected from Ostrich Nepal Pvt Ltd., Gongolia-1, Rupandehi, Nepal, the first Ostrich farm of Nepal with the aim of determining the prevalence of GI parasites (Protozoa, trematode, nematode and cestodes) in those samples. Sedimentation technique of fecal examination was carried out to observe the parasites in the faecal samples. An overall prevalence of parasite was found to be 40% and 33 (31.43%) were found to be Protozoa and 9 (8.57%) were found to be nematodes while Trematodes and cestodes were found to be negative. The study indicated higher prevalence in GI parasites. This study on Ostrich should be conducted on regular basis and necessary prevention and control measures to be taken for safe production.

Detection of helminth parasites in goats slaughtered at retail meat shops in Bhaktapur District

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A cross-sectional study was conducted to find out the occurrence of the helminth parasites in goats slaughtered at various meat shops in Bhaktapur District from February to April, 2017. Altogether 102 faecal samples were collected from the small intestines of the slaughtered goats at 64 purposively selected meat shops across the District and were examined for presence of helminth parasites in the Parasitology Laboratory of Himalayan College of Agricultural Sciences and Technology

(HICAST). The samples were examined qualitatively by sedimentation technique and floatation technique. Out of 102 samples, 32 (31.37%) samples were found positive for helminth parasites and 70 (68.63%) samples were negative. Occurrence of nematode parasites was highest (78.12%), followed by trematodes (21.88%) and all samples were negative for cestodes. The occurrence of helminth parasites was highest in the goats collected from Ramechhap (66.67%) and least in the goats collected from Khasibazaar (13.33%). Out of 32 positive samples, 22 (68.75%) were from goats below 30 kg of live body weight and 10(31.25%) were from goats above 30 kg of live body weight. The questionnaire survey revealed that out of 64 meat shop owners interrogated, 15 of them (23.44%) had observed adult parasites in the intestine of the goats slaughtered at their shops at times while 49 respondents (76.56%) did not observe adult parasites at any time during the slaughter. Out of 15 meat shop owners who have found adult helminth parasites in the past, 7 found them in the goats collected from Ramechhap (46.67%), 4 in the goats brought from Dolakha (26.67%), 2 in goats brought from Khasibazaar (13.33%) and other two meat shop owners found the parasites in goats collected from other sources (13.33%). This study showed moderate occurrence of helminth parasites in the goats slaughtered at different meat shops in Bhaktapur District.

Contamination of coliform in raw milk from different collection centres of Kathmandu District

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Milk is an important source of nutrients to human and animals, but due to its high water activity and nutritional value it serves as an excellent medium for growth of many kind of microorganisms under favorable conditions. The present cross sectional study was conducted to assess coliform load in raw cow milk from different collection centres of Kathmandu District. The study was conducted at Central Veterinary Laboratory (CVL), Tripureshwor, Kathmandu from February to April, 2017. A total of 104 raw milk samples were collected from different sites of Kathmandu District (Tokha, Nepaltar, Goldhunga, Sitapaila, Nagarjun, Ramkot, Gaushala, Guheswori, Gothatar, Mulpani). Sample collection was done randomly from various location of Kathmandu District. Samples were collected in sterile bijou bottle and kept in coolbox along with icepack and transported to laboratory. Samples were serially diluted by using Quarter Strength Ringer's Solution (QSRS) and diluted samples were pipetted on eosin methylene blue (EMB) agar and incubated for 24 hours. After incubation for

24 hours colonies showing characteristic metallic sheen on EMB agar were picked up and considered as presumptive for coliform. All the isolates were stained by Gram's method to determine purity of isolates. All the colonies on plates were counted after incubation period. Out of 104 raw milk samples tested, 97 (93.26%) samples were found to be positive for coliform and the highest count was $1.96 \times 10^{10} \pm 6.34 \times 10^9$ the lowest was $7.58 \times 10^5 \pm 6.37 \times 10^5$. The result indicated that raw milk was not safe. The result showed poor hygienic quality of milk. The presence of coliform in the milk might be due to poor hygienic condition of the farm, lack of cleaning and sanitation of the working area, contamination during handling of milk. Good veterinary practices and good agriculture practices should be encouraged to the farmer's level. The major preventive measures include adoption of good manufacturing practices.

Present status of traditional pig farming in Kathmandu District

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The aim of this study was to determine the present status of traditional pig farming in Kathmandu including economic status. Both the primary and secondary data were collected for this study using R ver. 3.3.3 (R Core Team, 2017). Welch's t-test was used to compare average net income between net income of feed types and genders. Pearson's correlation coefficient was calculated to identify the relationship between net income and various factors (like age of farmers, years of experience and age of pig sold). Mean age of farmers involved in pig rearing in Kathmandu District was of 39 years. Most of them had about 6 years of experience. On average farmers reared about 31 piglets per farm. Higher number of male farmers (61.2%) was involved in pig farming compared to females (38.7%). Concentrate feed (0%), Hotel waste (85.7%) was preferred by most farmers as feed source compared to dumping waste (14.3%) for their pigs. This study revealed that total cost accrued for pig farming was NRs 18,070 and net income per pig was NRs. 5,613. There was no significant difference ($p > 0.05$) in net income in pig farming while feeding hotel waste or dumping waste, and gender of farmer. The higher (1:1.31) cost benefit ratio and the lesser break even point (7.41%) of pig production indicated lesser risk in this business in Kathmandu. Study finding clearly revealed that traditional pig farming can be profitable and economical in Kathmandu District.

Prevalence of haemoprotozoan parasites in cattle of Sunsari District

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Haemoprotozoan diseases, especially babesiosis, anaplasmosis, theileriosis and trypanosomiasis are considered some of the major impediments in the health and productive performance of cattle. To find out its status, study on prevalence of haemoprotozoan parasites in cattle was conducted during 20 January 2017 to 20 April 2017 of exotic and indigenous cattle of Sunsari Districts. A total of 110 blood samples (55 from exotic cattle of Itahari and 55 from indigenous cattle of Inaruwa Municipality) were collected. Out of 110 samples, 6 (5.45%) were positive for anaplasmosis. Among 6 positive samples, 1 (16.66%) was from Itahari (exotic breed) and 5 (83.33%) from Inaruwa (indigenous breed), 2 samples (1.81%) were positive for theileriosis (from exotic breed). 3 samples (2.72%) were positive for trypanosomiasis. Among 3 positive samples, 1 (33.33%) was from Itahari (exotic breed) and 2 (66.66%) from Inaruwa (indigenous breed). 1 sample (0.9%) was positive for both Anaplasmosis and Babesiosis from Itahari (exotic breed). Breed wise and age wise the prevalence of haemoprotozoan in Sunsari District was not significant ($P>0.05$). This showed that, in both exotic and indigenous breeds and irrespective of age the prevalence of haemoprotozoan was similar. It may be due to the similar climate, similar watering and feeding practices, common housing etc. A suitable preventive and control measures including the regular dipping and spaying against external parasites (ticks, flies) and awareness programs for farmers, technicians and stakeholders at all level are warranted.

Prevalence of subclinical mastitis and reproductive disorders in Chauries of Dolakha District

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A study was conducted to find out the prevalence of subclinical mastitis and reproductive disorders in Chauries of Dolakha District (Lakuridhada, Bouch and Kalinchowk VDC's) during March 2017 to April 2017. A total of 280 milk sample were collected and California Mastitis Test (CMT) and White side test were

conducted along with use of mastrip paper which were carried out in field. A total 3 samples (1.07%) were found positive for mastitis and 277 samples (98.93%) were detected negative. Among positive samples 1 sample (0.36%) showed positive from RF quarter and 2 samples (0.71%) showed positive from RH quarter. Out of 280 samples 152 samples were collected from dimjo Chauries with 2.34% positive for subclinical mastitis. Similarly, from the questionnaire survey overall prevalence of reproductive disorders 45(20.73%) where 13(5.99%) animals showed retention of placenta, 12(5.53%) animals showed anoestrus, 12(5.53%) animals showed repeat breeding and 8 (3.69%) animals showed abortion. The average herd size was consisted of 28 animals. A total of 224 Chauries herd composed of 119(53.13%) urang, 98(43.75%) dimjo and 7(3.13%) bull. The prevalence of mastitis and reproductive disorders can be minimized by introducing the practice of teat dipping, periodic CMT and nutritional supplements, vaccination respectively.

Study on the prevalence of helminth infestation and its associated risk factors in captive Asian elephants (*Elephas maximus*) of Sauraha, Chitwan

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A total of 65 fecal samples from captive Asian elephants (*Elephas maximus*) of Chitwan National Park (CNP), National Trust for Nature Conservation NTNC, and private elephants of Sauraha, Chitwan were collected and examined for the study of helminthes infestation during February to March, 2017. The samples were examined qualitatively by sedimentation and flotation method for identification of helminthes eggs. CNP is bordered by a buffer zone, populated by humans, livestock and wild animals. The border of the CNP and buffer zone has become a common place of interactions between the wild animals and farm livestock leading to high possibility of transmission of different types of diseases including helminthes. Out of 65 samples 48 (74%) samples showed positive for helminthes, and 17(26. %) were negative. Among the positive samples which 23 (48%) samples had single infestation and 25 (52%) had mixed infestation. Class wise prevalence revealed higher infestation of trematodes 41 (85.41%) was found compared to nematodes infestation 7(14.58%). Species wise prevalence of helminthes revealed higher 25(52.08%) prevalence of *Paramphistomes* followed by *Fasciola* 16 (33.3%) and *Strongyloides* 7(14.5%). Higher 40(73%) infestation was detected in private elephants than the government 25(27%) ones. Out of 55 dewormed elephants (85.6%), non- dewormed 10 (20.8%), 48(74%) were found

to be positive for different parasitic species. Higher 55(89%) prevalence was found than 10 (11.11%), sex wise prevalence.

A survey on livestock husbandry practices and perceptions on zoonotic diseases among people in three VDC's of Dhading District

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A cross-sectional questionnaire based study was conducted among five in three VDCs of Dhading District. The questionnaire was designed to obtain information on farm management practices and meat and milk and environmental hygiene followed by the respondents, awareness about zoonotic diseases, mode of transmission, symptoms, treatments and prevention method applied. Altogether 493 people responded to questionnaire. All respondents participated in this study were literate and were widely practicing mixed farming system (55.2%) including both stall fed and free range system of livestock rearing. Hygienic practices such as wearing separate cloth when working in livestock farm was negligible. There existed no practice of livestock health check up prior to buying with quarantine practice being followed by only 1.82%. Livestocks vaccination status was also not insatisfactory level as only 30% of the respondents have used vaccination for one or more than one diseases. Majority of the respondents who owned the dogs, feed their dogs with raw offal and allow their dogs roam freely in their premises. Although majority (71.6%) responded about zoonoses, only 28.14% respondents knew about zoonotic diseases definition. Among 493 respondents, 100% knew about rabies and helminthic parasite, followed by Avian Influenza (98.17%), Bovine tuberculosis (8.31%), brucellosis (1.41%) and leptospirosis (1.01%). Majority (72.4%) and around half of the respondents knew about modes of transmission and who are at risk of zoonotic diseases, respectively. Majority of the respondents (70.38%) were aware of zoonotic diseases transmission from raw milk and meat consumption although the practice of consuming raw milk (84.58%) during religious occasion still existed. Among five zoonotic diseases, less than 25% respondents knew about the defined cause and prevention of these diseases. Bringing awareness among the public about the threat to them through zoonotic diseases, their modes of transmission, prevention and control measures should be considered as most important to protect them.

Prevalence of fasciolosis in goats of Siraha District

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This study was conducted to determine the prevalence of the *Fasciola* species in goats based on age, sex, breed, location and feeding. A total of 500 faecal samples of goats were collected from the four different areas of Siraha District (Barharamaal, Jamdaha, Phoolbariya, Bano). The questionnaire survey was conducted to collect the information about management system, grazing pattern, drenching history, age, breed and sex. Microscopical examination was performed for the detection of eggs of *Fasciola* sp. using sedimentation technique at District Livestock Service Office, Siraha. The overall prevalence of fasciolosis was found to be 20.2% (101/500). There was a significant difference in findings of *Fasciola* eggs in goats in different age groups ($p < 0.05$) and the highest prevalence (39.65%) was found in the goat of more than four years old. In terms of breed, prevalence of *Fasciola* was significantly different ($p < 0.01$), with 19% prevalence in native breeds, 22.5% in cross breeds and 42% in exotic breeds. Based on location, the *Fasciola* prevalence did not vary significantly ($p > 0.05$). Prevalence of *Fasciola* was not significantly different ($p > 0.05$) between stall feed and free- grazing feeding system. Sex wise prevalence revealed 27.5% in males and 32.6% in females which did not vary significantly ($p > 0.05$). This study showed fasciolosis as an inherent problem in native breed and this information will be useful for goat industry and should consider age and breed while implementing control programme in Siraha District.

Prevalence of sub-clinical mastitis in dairy buffaloes of Maintada VDC of Surkhet District

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A cross sectional study was carried out from March to May 2017 to find out prevalence of sub-clinical mastitis in dairy buffaloes of Maintada VDC of Surkhet District using CMT reagent in paddle by directly collecting milk from the teats. A total of 114 animals were considered for this study comprised of 456 quarters. Out of 114 buffaloes 102 were found to be positive. The prevalence was found highest in RF (28.37%) which was followed by LF (24.46%), RH (23.76%) and LH (23.41%)

respectively. Mastitis was highly positive in cross breed buffaloes (77%) than local (23%) ones, with more cases prevalence in second lactation (30.39%) followed by third, first, fourth, fifth, seventh and sixth. Questionnaire survey was done in 14 household regarding human demography, animal demography, knowledge of mastitis and hygienic practices regarding floor condition, type of shed, distance between shed and manure pit. Only 49% of respondents were literate with 7.02% acquiring training on dairy farming. Major source of income for the farmers in surveyed area was cereal crop agriculture (53.51%), foreign employment (24.56%), private job (12.28%) and civil service job (9.65%). 52% of the farm floor was wet and 48% dry where 92% farm floors were non-concrete with 8% being concrete floor. This might be due to lack of knowledge, lack of hygienic practices and better farm management. Considering the result of this study in buffaloes of Surkhet District, suitable preventive and control measures for mastitis should be carried out. Effective awareness programmes for farmers are recommended. Occurrence of sub-clinical mastitis showed statistically no significant difference between quarterwise, breedwise and stage of lactation.

Occurrence of gastrointestinal parasites in Dogs brought at Kathmandu Veterinary Clinic based on coprological examination

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A study was conducted during April to June, 2017 to find the occurrence of gastrointestinal (GI) parasites among the dogs brought at Kathmandu Veterinary Clinic (KVC) based on coprological examination. A total of 103 samples were collected from the dogs of different age group (puppy, young and adult), different breeds (local and exotic) and both sex (male and female). 16 (15.53%) samples were found positive for GI parasites. Five different parasitic species were identified as *Entamoeba sps* (37.5%), *T.canis* (18.75%), *A. caninum* (18.75%), *D. caninum* (12.5%) and *Isospora canis* (12.5%). Age-wise, the highest occurrence (21.42%) was observed in puppies. Sex-wise, higher occurrence (47.14%) was found in male dogs compared to the females (14.28%). Symptom-wise, the highest occurrence (75%) was detected in symptomatic dogs as compared to asymptomatic dogs (25%). Breed-wise, higher occurrence (10.41%) was observed in Mongrel breed. Highest occurrence (20%) was observed in dogs with no history of deworming compared to dogs with deworming history (10.41%). Questionnaire survey was conducted to assess the knowledge on zoonotic aspects. Out of 103 pet owners 16.50% were found to have knowledge on parasitic zoonoses and remaining 86% owners did not have any knowledge of

parasitic zoonosis. Highest occurrence (20%) was observed indogs fed other source of water (dirty and stagnant water) as compared to filtered water (19.04%) and tap water (13.43%). Similarly 75% of dogs defecating outside house were positive for GI parasites compared to those defecating inside their home (25%). Lack of proper knowledge on GI parasites, deworming schedule possess increased threat for occurrence of parasitic infection in dogs. Good managemental practices, awareness on risk of transmitting zoonotic diseases, deworming schedule is essential to reduce the parasitic burden indogs.

Prevalance of brucellosis in goats of Dolakha District

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A study was conducted during March to May 2017 to find the prevalence of Brucellosis in goats (Jamunapari cross, Khari and Sinhal) of Dolakha District. Out of 110 serum samples collected a total of 5 (4.5%) samples were found to be positive for antibodies against *Brucella* spp. with Rose Bengal Plate Agglutination Test (Prionics AG, Switzerland). The prevalence was found higher in males (6%) than in females (3%). The percentage of prevalence of brucellosis in Jamunapari cross breed goat was found higher (6%) than in Khari goats (5%) while all goats of Sinhal breed were found to be negative. Age wise prevalence of Brucellosis revealed higher positivity in goats of 7 years age (50%) followed by 5 years age (14%) and then 3 years age (8.33%) and lowest among goats of below 1 year age (5.8%) inVDC's and municipality-wise, higher prevalence of brucellosis was found in Melung VDC (20%) followed by Bhieshwor Municipality (10%) and samples from rest of the VDC's (Bhedapu, Bhirkot, Jhule, Kshetraba, Malu) were negative. There was no significant differences between different age, sex, breed and prevalence of brucellosis ($p>0.05$). Considering the result of this study in the goat population of Dolakha District, suitable preventive and control measures of brucellosis should be carried. Effective quarantine, legislative measures and awareness program for farmers, meat sellers are recommended.

Prevalence of *Cryptosporidium* in goat, Gokarneshwor Municipality

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Cryptosporidium is an important zoonotic pathogen transmitted primarily through water. This study was conducted to determine the occurrence of *Cryptosporidium* in goat where the water drains from the Shivapuri National Park. This cross sectional study was conducted during month of February to April, 2017. A total of 196 fecal samples from goats were collected from Gokarna, Mulkharka, Okhraeni, Chilaune, Sundarijal of Gokarna Municipality. Laboratory examination was carried at HICAST, Kalanki and Shrestha Veterinary Centre, Gokarna. The samples were stained by Ziehl-Neelsen's staining technique and observed at low power microscope (10x) for the presence of parasites. The overall prevalence of cryptosporidium oocyst from the coprological study was 11.22 percent. In the age groups of 6 months to 1 year, 1 year to 2 years and above 2 years, the prevalence rate was 18.18percent, 11.66 percent and 6.17 percent, respectively. Faecal examination showed statistically difference between the age group of the goat. Thus, the study suggests further research for the health safety of the goat in Gokarneshwor Municipality.

Sero-Prevalence of brucellosis in dairy cattle of Sunsari District

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Brucellosis is one of the highly infectious bacterial zoonotic diseases that cause abortion in dairy cattle. To find out its status, a sero-prevalence study was conducted during 20 January to 20 April 2017 in aborted dairy cattle of Sunsari District. A total of 115 serum samples were collected from indigenous and exotic cattles of Sunsari District including the history of abortion, still birth and other symptoms (fever, repeat breeding) related to brucellosis were collected. A total of 7 (6.08%) samples were found positive by Rose Bengal Antigen Test (IVRI/India). Age group above 4 years (5 positive samples) shows more prevalence rate. VDC-wise prevalence shows higher in Itahari (3 out of 7). A questionnaire survey was carried out during samples collection among farmers. All the respondents in the study area adopted artificial insemination technique. Considering the prevalence of the brucellosis in the dairy pocket areas and its threat for transmission to other animals and human, a suitable preventive and control measures including the regular test and segregation of sero-positive animals,

effective quarantine, legislative measure and awareness programs for farmers, veterinarian, technicians and stakeholders at all level are warranted.

Prevalence of fasciolosis in cattle of two municipalities (Kageshwori and Gokarneshwor) of Kathmandu District

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A study on prevalence of fasciolosis in cattle of Kathmandu District was conducted during the month of February to April, 2017. This study was conducted at Pathology Laboratory of Himalayan college of Agricultural Science and Technology, Kalanki and Shrestha Veterinary Centre, Nayapati. A total of 200 faecal samples were collected from 2 municipalities (Kageshwori and Gokarneshwor) of Kathmandu District. The samples were examined as described by Hansen and Perry (1994). The overall prevalence determined from the coprological study was 37.5% (75). The prevalence of fasciolosis according to age was found to be highest in the age of >5 (36.75%) followed by 2-5 years (35.05%) and <2 years (28.2%). The prevalence of fasciolosis according to location was found to be 38.66 % (29) of the samples of Gokarneshwor Municipality and 61.33 % (46) of Kageshwori Municipality. Faecal examination showed statistically significant difference between age and location.

Study on antibiotic residues in marketed broiler meat of Kathmandu Valley

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The study was carried out to detect the antibiotic residues in broiler meat collected from the retail meat shops of Kathmandu, Bhaktapur and Lalitpur Districts of Kathmandu Valley during the period of February 2017 to April 2017. The study was a descriptive cross-sectional study. Meat samples were collected from purposively selected 35 retail meat shops of each three Districts and tested in the laboratory of VDSAO. The samples were tested according to the protocol of the RR test kits (Rodejanarug Pharmaceutical Limited Partnership, Thailand) for tetracycline groups, macrolide / aminoglycoside / sulfonamide groups and penicillin groups. The positive results of macrolide / aminoglycoside / sulfonamide groups were further tested only for sulfonamide positive by using Quicking Biotech Rapid Test Kit (Quicking

Biotech Co., Ltd., China). Among 105 meat samples analyzed, 33.02% were found positive. The study detected the residues of tetracycline, sulfonamide and penicillin to be 50.48%, 21.90% and 18.10% respectively. Out of 35 meat samples subjected to 105 tests, from every District, prevalence of positive case for antibiotic was found highest, 32.38% at Kathmandu, 30.48% Lalitpur and 27.62% at Bhaktapur. The location-wise prevalence of Tetracycline residue was found to be highest (57.14%), in Lalitpur followed by Kathmandu (51.43%) and Bhaktapur (42.86%). Sulfonamide residue was found 22.86% in both Kathmandu and Bhaktapur and 20% in Lalitpur. Penicillin residue was found to be highest (22.86%), in Kathmandu, followed by Bhaktapur (17.14%) and Lalitpur (14.29%). However there were significance difference between the prevalence of different antibiotic residues in broiler meats in different Districts ($p>0.05$). The highest residue were found for Tetracycline which may be due to the frequent use of this group for treatment and as feed additives, its high tissue affinity, high concentrations in the excretory organs and slow elimination. This study showed that there is presence of significant antibiotic residue in marketed meat of Kathmandu valley.

Prevalence of mastitis in cattle and buffaloes of Sonpur VDC of Dang District

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A cross-sectional study was conducted during March to April 2017 to find out prevalence of sub-clinical mastitis in dairy cattle and buffaloes of Sonpur VDC of Dang District. Initial questionnaire survey was carried out in 150 households. Majority of population (56.2%) in the study area was found to be literate. Agricultural crops were the major source of income for farmers. Most of the farmers (75.8%) in the study area practiced two times milking and majority of the animals (13.7%) were rested immediately on the floor the after milking. Survey also revealed most of the farmers (91.5%) in the study area did not have training on dairy farming but they had knowledge on mastitis (73.2%) and majority had cross bred cattle and local buffaloes. Milk samples of 103 animals (70 buffaloes and 33 cattle) that comprised of 412 quarter were collected and tested using California Mastitis Test (CMT). The 44/70 (62.85%) buffaloes and 20/33 (60%) cattle were found positive in CMT. There were no significant differences in finding subclinical mastitis (SCM) between breeds, quarters, milk productions and floor type. However, the highest CMT positive milk was from cross-bred (59.25%) and RH quarter (30%) of cattle and local breed

(81.25%) and LH quarter (39%) of buffaloes. Similarly, the highest SCM was found in the high yield animals (>6 litres). Therefore, there is not only a need of proper intervention and farmers training, but also require to monitor and survey of SCM to reduce the incidence of mastitis in animals and related economic losses to the farmers.

Prevalence of fasciolosis in goats at Shaniarjun Municipality of Jhapa District

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This study was conducted from December, 2016 to February, 2017 to find out the prevalence of Fasciolosis in goats of Shaniarjun Municipality of Jhapa District. A total of 396 faecal samples were collected from Simalchowk, Kalisthan, Hattikilla and Arjundhara and they were examined for *Fasciola* spp. in the Laboratory of Livestock Service Center, Shaniarjun Municipality of Jhapa. The samples were examined qualitatively by sedimentation technique as per Soulsby (1976) for identification of eggs of *Fasciola* parasites. A total of 303 (76.52%) of samples were found to be positive for *Fasciola* parasites whereas 93 (23.48%) samples were found to be negative. Prevalence of fasciolosis in Simalcholk was the highest 85.15% and Kalisthan showed a lowest 69.70%. Male showed the prevalence 143/196 (72.96%) of positive samples while female showed comparatively higher prevalence with 160/200 (80.00%) positive cases of fasciolosis. According to deworming status, the highest prevalence 65% in irregular deworming and lower prevalence (33%) in regular deworming.

3. AGRIBUSINESS MANAGEMENT

Information and communication technology (ICT) contribution in economic and managerial aspects of poultry farming in Kathmandu Valley of Nepal

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The study assessed the contribution of ICT in economic and managerial aspects of poultry farming. Household survey was carried out during 21st July – 5th September, 2015. Randomly selected 44 respondents from Bhaktapur, Kathmandu and Lalitpur Districts were interviewed and a focus group discussion was conducted. TV and mobile phones were common to all. Scope of ICT application in MI, MIS, ERP, Disease control, MDS, SC and VC was observed. Economic and educational benefits were perceived by majority of the farmers (44 and 35% respectively) from ICT. Most of the farmers were potential for ICT application (54.54% potential and 31.81% high potential). Treatment group, experienced and trained farmers were found significantly higher potential. Cost of ICT in poultry production was found NRs. 8712.591 per cycle while net ICT return was found NRs. 15382.46/cycle. Significant difference in net ICT return was observed in higher potential, treatment group and postgraduate level of education of the farmers (NRs. NRs.12130.00, NRs. 8733.09 and NRs.16000/cycle respectively). Benefit cost ratio of ICT (1.77) indicated that ICT is profitable input in poultry farming. Average net poultry return per cycle of poultry production was found NRs. 82726.48 and it was significantly higher among higher potential farmers (NRs. 367000.00 per cycle). On an average ICT contribution in poultry farming was found 8.06 percent. ICT contribution was found significant in medium and small farmers (27.81% and 22.24% respectively). Farmers agreed (54.54%) that ICT could be an important tool for poultry farming. Mobile, internet and TV was ranked as the 1st, 2nd and 3rd rank respectively in their importance. Face book (40%), Viber (10%) and twitter (10%) were the major mass media farmers were found aware. Farmers could not explore full yield potentiality of ICT due to various barriers such as poor power supply, poor network reception and inadequate access to ICTs.

Value chain analysis of off-season tomato production under polyhouse system in Dhading, Nepal

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A study was carried out to analyze the value chain of tomato subsector with focus on off-season tomato production under polyhouse system in Dhading. Pre-tested questionnaire was administered to survey 77 randomly selected respondents from different level of actors of tomato value chain during November to December 2016 A.D. The survey revealed that off-season tomato cultivation in polyhouse is gaining popularity in recent years among farmers. Cost of plastic tunnel, drip irrigation, and labor cost were major cost factors for off-season tomato production in polyhouse system. Average cost of tomato production under poly-house was found to be NRs. 22 /kg while average market price was NRs. 40 /kg. Net profit was found to be between NRs. 16000 to NRs. 25,000 per ropani. The benefit Cost (B/C) ratio also ranged from 1.84 to 1.9. Positive benefitcost ratio received by the tomato growers of the study district showed that tomato cultivation is a profitable enterprise. Marketing efficiency was 0.87, 0.60 and 0.28 for off-season polyhouse, off-season open field and seasonal cultivation respectively which also favors for polyhouse production system. Freshness was the most preferred quality followed by size, price and color. The major value addition done prior to reaching the final consumer is limited to primary and simple processing like cleaning, grading and packaging in plastic crates. Negotiation between the farmers and traders was the most common method of price determination followed by asking with fellow producers. Different constraints identified in production were: damage due to insect and pest followed by lack of finance and insufficient irrigation, whereas local transportation from the farm to collection center during rainy season was the major constraint in marketing of tomato. There is also lack of intensive technical support for off-season polyhouse tomato production. However presence of well-functioning collection centers has to some extent facilitated both the producers and collectors.

4. DAIRY & MEAT TECHNOLOGY

Studies on quality of probiotic yoghurt fortified with apple pulp and honey

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Fermented dairy products, having the tradition as healthy foods, are a natural choice for their makeover as functional foods. Consumption of fermented dairy products improve host metabolism by maintaining balance of the intestinal micro flora and may thus have a positive effect on the host. A study on qualities of probiotic yoghurt fortified with apple pulp and honey was conducted in DDC (Dairy Development Corporation, Lainchaur, Kathmandu, during the period of November 2016 to February 2017. The products were made and stored at refrigerated condition, at around 5°C, and was subjected to organoleptic, physicochemical and microbiological analysis at 0, 7, 14, 21 and 28th days of storage period. In overall sensory score, the color, texture, taste, mouth feel and overall acceptance attributes were given to the treatments C so called formulation f3 having formulation 6% apple pulp & 3% honey. The microbial analysis revealed that there were enough probiotic organisms in the products ranged from 1.1×10^7 to 42×10^8 cfu/ml. Appreciating the nutritional profits and healthy image of yoghurt endorsed by the addition of apple pulp & honey enhance yoghurt functionality, preventive medicine, and residence treatment in the new times requires persistent and transparent public education.

Process optimization of Gundpak

Radheshyam Khadka

This research was carried out to optimize the process of preparing the gundpak and to improve the nutritional quality of gundpak by using fresh white khoa instead of market stored brown khoa. The experiment was conducted at Himalayan College of Agricultural Science and Technology (HICAST), Kathmandu and N.R. Pustakari Udhog, Kalanki Kathmandu. The experiment was conducted in completely randomized design (CRD) with four treatments of of gundpak weighing 1000g, 750g, 500g and 250g prepared from stored brown khoa and another four treatments of

gundpak weighing 1000g, 750g, 500g and 250g prepared from fresh white khoa at N.R. Pustakari Udhyog, Kalanki Kathmandu and each treatment was replicated three times in both cases. The physiochemical properties such as Fat, Moisture, total ash, protein and carbohydrate were determined from both sets of samples. The four samples of gundpak prepared by using stored brown khoa are prepared by using the recipe followed by the N.R. Pustakari Udhyog. Hence they act as the control for all the four samples of gundpak prepared by using fresh brown khoa. The four samples of gundpak prepared from stored brown khoa are represented as Bk1, Bk2, Bk3 and Bk4 weighing 1000g, 750g, 500g and 250g respectively. Similarly, the four samples of gundpak prepared from fresh white khoa are represented as Fk1, Fk2, Fk3 and Fk4 weighing 1000g, 750g, 500g and 250g respectively. The samples weighing 500g in both cases (i.e. Bk3 and Fk3) were accepted to be of good quality from the result obtained from the sensory evaluation. The CV of moisture, protein, total ash, fat and carbohydrate are 8.83%, 9.93%, 3.62%, 4.83% and 3.02% respectively.

Process optimization of quality Chhurpi making

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Chhurpi is a milk product after cream separation from milk, which is locally and traditionally produced in hills and high hills of Nepal. There is no more research for quality chhurpi making. Therefore, process optimization of quality chhurpi is important. In the present research, mainly focusing on proper process of chhurpi making, we studied optimum fat percent in the milk, correct drying time in days and minimum moisture percentage in product for quality production and long shelf life. Research study covers fat percentage in milk 0.2, 0.5, 1.0, 1.5, and 2.0 where, drying time were 15 days, 30 days, 45 days and 60 days. Moisture percentage was tested in the lab. Lastly, sensory scores of product taste were tested with the record of likely, such as extremely likely, like very much, like moderately, like slightly, neither like nor dislike, dislike slightly, dislike moderately, dislike very much and dislike extremely. Likewise the hardness of the products were also tested by the record of very hard, hard, neither hard nor soft, soft and very soft. The prepared chhurpi were lab tested for getting their moisture percentage remain in the chhurpi were recorded. All the essential parts were studied in the research and overall acceptability are also done. According to panelists group records, chhurpi prepared from fat 1.5% in the milk having sensory taste according mouth feeling score is 7.929, best drying days 30 under the shadow of roof without smoking areas and moisture % is 10 was recommended the best chhurpi prepared from mixed milk of cows and buffaloes.

Preparation and quality evaluation of soya based yoghurt

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Yoghurt samples were produced from blends of soymilk and standard market milk using *Streptococcus thermophilus* and *Lactobacillus bulgaricus* as starter cultures. Ratio of soya milk to standard market milk was 90%:10%; 80%:20%; 70%:30%; 60%:40%; 50%:50%; and 100% regarded as treatment samples T1, T2, T3, T4, T5 & T6 respectively. The results of chemical analysis revealed protein contents were 3.432%, 3.334%, 3.389%, 3.345%, 3.482% and 3.175% respectively, for the samples. Fat contents varied between 2.91%, 2.78%, 2.47%, 2.39%, 2.24% and 2.06% were found respectively. The protein content of the yogurt of every treatment was significantly different at $p > 0.01$ with each other. But, in contrast to fat content, protein content was inclined in the increasing of soymilk proportion in blends. The blend having highest soymilk proportion T5 has highest protein content 3.482%. Total solids between all the samples 15.47%, 16.76%, 16.11%, 15.75%, 14.92%, and 16.39% were obtained with titratable acidity of 0.743%, 0.744%, 0.773%, 0.765%, 0.731% and 0.899% respectively. The microbiological examination revealed a nil count of coliform, yeast & mould level for all the samples of the products. No, significance difference was observed in terms of colour, taste and overall acceptability but the value obtained was similar to that of control. Therefore, on this basis, Soyabased yoghurt can be promoted as that of control T6. The benefit cost ratio obtained for the different treatments were largest for the treatment having highest soymilk proportion (50% soymilk blend with 50% standardized market milk, 1.75:1). The ratio decreased with the reduction in soymilk proportions, viz. 1.60:1, 1.47:1, 1.36:1, and 1.27:1 for 40% soymilk, 30% soymilk, 20% soymilk and 10% soymilk respectively. The treatment having no soymilk (T6) had lower benefit cost ratio. The benefit cost ratio calculation revealed that the cost of production of yogurt can be reduced by increasing proportion of soymilk blending.

Comparative study of different proportion of ostrich meat in poultry based emulsion sausage

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Fresh ostrich meat was collected from Ostrich Nepal Private Limited. Chilled poultry meat was collected from Valley Cold Store, Balaju, Kathmandu. Samples were

trimmed, cut in to 5x5 cm pieces and frozen for 24 hrs at -20°C. Frozen meats were thawed to $\pm 1^{\circ}\text{C}$, minced and chopped to prepare emulsion and finally stuffed in cellulose casing, vacuum packed and cold stored ($5\pm 2^{\circ}\text{C}$). The sausage products obtained from different treatments analyzed for physicochemical constituents found pH (5.63-6.23) in decreasing trend), water holding capacity (0.54-0.67) in decreasing trend), moisture (64.8-69.39% decreasing trend), yield (94.44-97.84% increasing trend), protein (12.61-14.44% increasing trend), fat (17.75-20.32%, decreasing trend) and total minerals (1.26-1.96, increasing trend). From the sensory evaluation on the basis of color, flavor, texture and overall acceptability of sausage samples, the treatments were significantly different at 5 % confidence level ($p < 0.05$). Sensory scores for overall acceptability resembles that treatment T3 (with 30% ostrich meat based sausage) was best among the 5 treatments. The major parameters studied for the storage stability were peroxide value (PV) and total plate counts for microbes. The PVs in all the treatments were increased significantly by the progress of the storage period up to 60 days. The initial PV was found 0.65 (meq/kg fat) in 50% ostrich sausage reached to 7.67 and found in the range of NS for the duration of 60 days. Microbial testing showed TPC was minimal with 976 cfu/g and 1410 in 50% and 0% ostrich sausage samples rose to 1250 and 1900 at 60th day. Up to the observed period of 60 days, there were no any objectionable qualities such as sliminess, putrid and rancid odor, fungal growth etc. detected in the sausages of all the treatments. The cost per Kg of 30% ostrich meat treated sausage among the panelists was calculated as NRs. 980.

Microbial hazard based on HACCP module on chicken sausage production plant

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A study on the assessment of microbial hazard based on HACCP module on chicken sausage production plant was carried out in two small scale sausage industries. Samples such as raw meat, batter, ingredients, casing, water and finished product were used for the analysis of total viable count (TVC), *Staphylococcus aureus* count, Coliform count and *Clostridium* count were done. All together 80 samples were analyzed from two industries (40 samples from each industry were taken. Among various steps of sausage production, between two industry there was a higher ($P < 0.01$) in TVC, *Staphylococcus* and Coliform count of raw meat, batter, after stuffing, casing (TVC) and water samples (*Staphylococcus* and Coliform count) of industry B

compared to A whereas there was no significant difference ($P>0.05$) between TVC of water, Coliform of finished product and *Staphylococcus* count of spices and finished product. Likewise, TVC, Coliform count of spices was significantly higher ($P<0.01$) of industry A compared to B whereas *Clostridium* count was significantly higher ($P<0.01$) of raw meat sample of industry B compared to A but was nil in samples of water, batter, spices, after stuffing, after cooking and finished product of both industries. Similarly, in comparison within the industry, microbial load of both industry showed that there was a significant difference ($P<0.05$) among the samples of raw meat, batter and after stuffing whereas there was no significant difference ($P>0.05$) with each other among samples like after cooking, finished product, casing, spices and water. Proper temperature maintained at cooking showed the lowering of load in after cooking samples in both industries whereas further increased in load was due to post cooking contamination. The effective Critical Control Point (CCP) was quality of raw meat and cooking temperature however CCPs should be monitored in every steps of processing.

Study on functional qualities of ostrich meat of different ages at chilled and frozen condtions

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A study has been made on quality of ostrich meats of different ages at chilled and frozen conditions by targeting product. Meat samples from two differently aged, 10 and 14 months' ostriches were collected and divided into three parts for each type. One part was analyzed immediately, one part was put in chilling at 4°C for 72 hours and next part was put in deep fridge at -20°C for 30 days. Proximate analyses were carried out for moisture (73.98 to 75.22%), protein (21.08 to 22.46%), total fat (2.43 to 3.27%) and total minerals (0.83 to 1.82%). There was subsequent decrement in moisture at cold storage practices, at 72 hours chilling by 1% and one month freezing by 2.3% and there was no difference of water content within the age of bird. The amount of protein was found increasing at chilling, freezing and age, total fat significantly different within the age as well as storage practices and total ash in decreasing trend in case of chilling and freezing conditions but no difference with age. Physicochemical analyses such as pH (5.62 to 6.04), water holding capacity (0.55-0.86), drip loss (0.41 to 1.90%) and cooking loss (21.49 to 39.21%) were analyzed. The pH and WHC of ostrich meat is in decreasing trend with storage at low temperatures. Similarly, drip loss and cooking loss were found increasing and were

significantly different ($p < 0.05$). As functional parameters, intramuscular fats (1.42-2.26%), oxidative stability (0.75 – 2.68 mgMDA/Kg flesh) and emulsion stability (62.17% - 80.89%) as cooking recovery were estimated. Emulsion stability was significantly decreased with time intervals under both refrigeration and frozen conditions but insignificant with age. In contrary, oxidations were in increasing trend with storage periods and even at low temperatures.

Study on residue of commonly used antibiotics in meat and eggs of chicken in Kathmandu Valley

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A study on residue of antibiotics in meat and eggs of chicken in Kathmandu Valley was conducted. A total of 240 samples (120 chicken samples and 120 egg samples) were analyzed for quinolone residue by ELISA method. Samples with the quinolone residue above MRL observed from ELISA were subjected to HPLC for quantification. Poultry meat and eggs correlation among three districts and five sectors were carried out using Fisher's exact test to identify antibiotics residue challenge in specific district and sector. P-value was calculated and compared according to the district and sector. Results revealed that 88.33% and 80% of chicken meat and egg samples were positive for quinolone residue respectively. 92.3%, 88.5% and 85% of chicken meat samples of Bhaktapur, Kathmandu and Lalitpur contained quinolone residue respectively. Similarly, the highest and lowest prevalence of quinolone residue in chicken sample was from health (100%) and policy (75%) sector respectively. The egg samples of Kathmandu, Bhaktapur and Lalitpur district contained 83.9%, 76.9% and 65% quinolone residues respectively. Eggs collected from household sector had highest (100%) while education sector had lowest (66.6%) prevalence of quinolone residues. Three chicken samples had residue above MRL in HPLC which belonged to Kathmandu district each from commercial (Enrofloxacin - 387.3), education (Enrofloxacin - 1120.3) and health sector (Enrofloxacin - 246.3, Ciprofloxacin - 204.2). There was no significant difference in occurrence of quinolone residue on meat samples between three districts and five sectors for chicken samples. Quinolone residue on egg samples was also non- significant between three districts. There was significant variation ($p=0.005$) in occurrence of antibiotic residue in egg between household and that of commercial, education and health sector. The haphazard use of antibiotics, absence of direct veterinary supervision, and withdrawal period could be the deciding factor for high percentage of antibiotic residue in samples.