PROCEEDINGS

of the
Twenty Second Annual Students Research Sessions
Department of Animal Science
November 30, 2012

Faculty of Agriculture
University of Peradeniya
Sri Lanka

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S. M. C. Himali
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SRI LANKA

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MESSAGE FROM THE DEAN
FACULTY OF AGRICULTURE

I am most privileged and honoured to issue this message on the occasion of 22nd Annual Students’ Seminar day of the Department of Animal Science, Faculty of Agriculture, University of Peradeniya.

The Faculty of Agriculture is a pioneer higher education institute in the higher education system in Sri Lanka, that ready to shoulder the national need of producing the quality and efficient graduates who can move with the changing world of knowledge and technology. The Department of Animal Science of the Faculty is one of the great pillars that uphold the Faculty for its position in leading the country’s agriculture knowledge hub. Setting an example of quality and innovative student research, the Department of Animal Science invent a new tradition of the Faculty of Agriculture by holding the student seminar day in two decades back. This futuristic step that the Department took has evolved through years in fulfilling the objectives of the event.

The students’ seminar day of the Department of Animal Science is a unique opportunity for the graduates, who stepping out for the world tomorrow, to bring their wisdom to a national platform where interaction with the peers and prospective employers are possible. The partnerships the students built through such interaction are a wealth and strength that the Department and the Faculty has in our journey as a higher education institute to the challenging future.

I take this opportunity to congratulate the Department of Animal Science, especially the coordinator of the 22nd Annual Students’ Seminar day for staging the Students’ Seminar Day of the Department for the 22nd consecutive time in a finest manner to achieve its goals.

I congratulate the graduating batch and wish them a fruitful future

I wish the proceeding of Students’ Seminar Day 2012 a great success.

Dr. K. Samarasinghe
Dean/Faculty of Agriculture
MESSAGE FROM THE HEAD
DEPARTMENT OF ANIMAL SCIENCE

It is with great pleasure that I convey this message for the 22nd Annual Students Research Sessions, Department of Animal Science, Faculty of Agriculture, University of Peradeniya.

The Annual Students Research Session is a venue for students to present their research findings, share knowledge & advances in research & development and to build networks of professionals, researchers, educators and policy-makers in livestock and allied sectors. This year we are witnessing the successful completion of challenging and enriching series of research projects carried out by the students specialized in Animal Science in the Faculty of Agriculture. At the Department of Animal Science, students are given the opportunities to interact with distinguished experts and work in industries to get insights of the industry requirements, discipline their thinking and develop skills to work harmoniously in an organization. Furthermore, the Department emphasizes on the values of respect, excellence, teamwork, innovation and performance. It endeavors to interlace the learning and education process with ideals to shape the students and mold them into professionals with a strong sense of work ethics.

I believe that the Annual Student Research Sessions offers recent graduates the unique opportunity to learn, exchange information, as well as widen their existing network and will promote forward-thinking, insightful and valuable perspectives on the strategic challenges of the livestock and allied sectors.

I have no doubt that the high quality research session and the unique social activity will ensure your maximum satisfaction and guarantee a memorable experience. I would like to take this opportunity to thank all the sponsors, paper presenters and participants for their generous support extended to make the 22nd Annual Students Research session a success. The real hard work of the organizing team is highly appreciated and recognized.

Finally, as our graduates prepare to face the challenging world, I wish them a wonderful and successful career and expect that they go forth to make an impact on the world.

Prof. H. W. Cyril
Head / Department of Animal Science
MESSAGE FROM THE TWENTY SECOND ANNUAL STUDENTS RESEARCH SESSION COORDINATOR

It is indeed with great pleasure that I write this message on the occasion of the Twenty-Second Annual Students Research Session hosted by the Department of Animal Science. Every year, this event provides a platform for graduating agriculture students specializing in animal science to present their final year research findings. This exciting opportunity showcases the superior research training our students have received as well as demonstrates the high caliber of the Department of Animal Science students and staff.

This year thirty-two students are presenting their findings to prospective employers, scientific community and other stakeholders in the field of agriculture. Please find all extended abstracts compiled in this publication. With eight oral presentations and twenty-four poster presentations, a wide array of cutting edge animal science topics will be discussed.

As in the past, this year, too, several public and private sector institutions provided facilities for our students to develop and conduct their research projects. Such partnerships are vital for the success of this annual student research session. Additionally, I would like to acknowledge the expertise and support extended by our internal and external supervisors towards successful completion of the students’ research projects.

The seminar day would have not been possible without the generous contributions made by our sponsors and well-wishers. On behalf of Department of Animal Science, I extend my sincere gratitude to all of them. Finally, I would like to thank the entire academic, technical and support staff members of the Department of Animal Science for their assistance in making this event a success.

Congratulations to our graduating students, and I wish them every success in their future endeavors!

S.M.C. Himali
Coordinator/ 22nd Annual Students Research Session
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Batch of Students Majoring in Animal Science 2011-2012

Final year research projects conducted during year 2003-2011
SEMI ARTIFICIAL BREEDING OF CLIMBING PERCH (*Anabas testudineus*) UNDER SRI LANKAN CONDITIONS

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INTRODUCTION

*Anabas testudineus* (Climbing perch) is one of the hardy, indigenous freshwater fish species in Sri Lanka’s inland waters and is able to tolerate extremely unfavorable water conditions. They are well known for their taste, high nutritive value, recuperative and other medicinal qualities (Marimuthu *et al.*, 2009). Juveniles of *A. testudineus* are also having an export value in the aquarium trade (Pethiyagoda, 1991). This fish also can be potentially used as a biological control agent for mosquitoes. Therefore the method of mass production of seedlings has become mandatory for the conservation purposes and to culture this fish in reservoirs and ponds of Sri Lanka. Seedling collection of *A. testudineus* from the wild habitats is not a sustainable method. Therefore, the objective of this study was to develop a semi-artificial breeding technique for *A. testudineus* under Sri Lankan conditions.

MATERIALS AND METHODS

Wild guppy (*Poecilia reticulata*), tilapia (*Oriochromis niloticus*) and tadpoles (*Bufo bufo*) of around 1 cm of total length were used to find out the most preferred live feed of *A. testudineus*. Sex of mature fish was differentiated by visual observation of genital organs externally. Mature *A. testudineus* in 1:1 ratio were introduced to spawning tanks having different conditions *viz*, water flowing condition with aquatic plants, water flowing condition without aquatic plants and stagnant water with aquatic plants. An intramuscular injection of Salmon Gonadotropin Releasing Hormone analogue (sGnRHa) (Ovaprim®) was administrated at 0.2, 0.35 and 0.5 mL/kg of body weight of fish as a single dose for females and half the dosage for males. Three replicates were used for three
treatments. Hormone treated fish were left to spawn in aerated glass tanks with a sex ratio of 1:1. Mean number of eggs laid, % fertility, % hatchability and % Survival of post-larvae after two weeks were determined.

RESULTS AND DISCUSSION

Results revealed that preference of *A. testudineus* for tadpoles (*Bufu bufo*) were significantly (*p*<0.05) higher than that of wild guppy (*Poecilia reticulata*) and tilapia (*Oriochromis niloticus*). Small (0-25 g), medium (25-50 g) and large (50-75 g) sized *A. testudineus* required 0.84, 1.78 and 1.93 g of tadpoles/fish/day respectively. Present study showed that *A. testudineus* do not breed naturally under captive conditions. Induce breeding using sGnRHa (Ovaprim®) hormone was found to be effective. Fish, which were administrated with Ovaprim® at 0.5 mL/kg of body weight released eggs. Mean number of eggs laid by *A. testudineus* with a mean body weight of 50.9±3.1 g and total length of 14.6±0.3 cm after a 12-15 hours latency period was 40 220±7 676. Mean fertility rate was 93±10%. Eggs hatched after 24-26 hours and % hatchability was 80±15. Survival rate of post larvae after two weeks was 18.3±4%

CONCLUSION

Present study indicates that administration of sGnRHa (Ovaprim®) at the rate of 0.5 mL/kg of body weight can be used to successfully breed *A. testudineus* under Sri Lankan conditions.

REFERENCES


EFFECT OF DIFFERENT PACKAGING MATERIAL ON QUALITY CHARACTERISTICS OF CHICKEN EGGS DURING STORAGE

H. K. J. P. Wickramasinghe¹, J. K. Vidanarachchi¹, S. M. C. Himali¹ and P. S. Fernando²

¹Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya. ²Bacteriology Division, Veterinary Research Institute, Gannoruwa.

INTRODUCTION

The quality of eggs can be affected by the environmental conditions such as temperature and humidity of storage, as well as the gaseous environment and storage time (Akyurek and Okur, 2009). However, the effect of packaging material and storage time and their interaction on quality characteristics of chicken eggs during storage under Sri Lankan conditions is yet to be discovered. Therefore, the aim of the present study was to determine the effect of different egg packaging materials (egg cartons) and storage time and their interaction on change of quality characteristics of chicken eggs during storage at room temperature (32 °C) in Sri Lanka.

MATERIALS AND METHODS

A total of 500 eggs were obtained from Shaver Brown hens, which were collected at one time when the hens were 40 weeks old from a farm (Switz Lanka Layer Farm, Madurankuliya, Puttalam). Collected eggs were subjected to four different treatments such as packing in paper molded egg cartons, polystyrene egg cartons, plastic/PVC (polyvinyl chloride) egg cartons and unpacked (control), while the experimental design was Completely Randomized Design (CRD) with three replicates per treatment and experimental unit was the egg carton which contained 10 eggs. Eggs were sampled fresh (20 eggs) and after storage (120 eggs/week) for 1, 2, 3 and 4 weeks at 32 °C. At sampling, eggs were weighed, broken and yolk index, yolk pH, yolk color, air cell depth, Haugh unit, albumen pH and weight loss (%) were determined. Separate samples from each treatment were subjected to microbiological analysis for the enumeration of Salmonella, Escherichia coli and determination of Total Viable Plate Count (TVPC) of the internal content of eggs. The results were
subjected to analysis of variance (Repeated Measures ANOVA) and the means were compared by Least Square Means (LSM) test at $\alpha = 0.05$.

**RESULTS AND DISCUSSION**

There was a clearly negative effect ($P<0.05$) of storage time on Haugh unit, yolk index and yolk color of chicken eggs regardless of the treatment at 32 °C. Weight loss (%) and depth of air cell significantly ($P<0.05$) increased regardless of the treatment with increased storage time at 32 °C (Figure 1 and 2). Interactions between the treatments and the storage time were significant ($P<0.0001$) with respect to air cell depth and albumen pH while interactions related to weight loss (%), yolk index and yolk pH were significant at $P<0.05$ at 32 °C. Eggs from different treatments were all microbiologically safe throughout the four weeks of storage at 32 °C according to the specifications given by the ICMSF (1986).

**CONCLUSION**

The most effective egg carton is plastic/PVC carton as it is found to be better and stable in preserving quality characteristics of packed eggs at least for four more weeks compared to other egg cartons (paper molded and polystyrene) and the control (unpacked) at 32 °C.

**REFERENCE**

EVALUATION OF HYDROPONICALLY GROWN MAIZE AS A FEED SOURCE FOR RABBITS

S. Thadchanamoorthy¹, V. P. Jayawardena¹ and C.G.C Pramalal²

¹Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya. ²Pasture Division, Veterinary research Institute, Gannoruwa.

INTRODUCTION

Rabbits are becoming a popular livestock species in Sri Lanka. Ensuring nutritious and economically viable rabbit feeds are vital for the promotion of this species as farm animals. Currently, feeds formulated exclusively for rabbits are not available in the local market. Hydroponic fodder could be a viable feeding option for rabbits. It is known to contain high amounts of protein, fiber and metabolisable energy and is highly digestible (Mooney, 2005). Currently, there is no sufficient information on the nutritional and feeding value of hydroponic fodder. This study was carried out to determine the nutritive value of hydroponically grown maize, and evaluate the feed intake, body weight gain and feed conversion efficiency of grower rabbits fed this forage.

MATERIALS AND METHODS

Locally available maize (Zea maize L) seeds of the variety Pacific A 99 were pre-soaked and incubated for two days. Soaked seeds (500g) were placed in trays and grown in a protected house. Albert’s solution 2%v/v was used as a nutrient media and harvested at 10th day after planting. Above process was repeated for one month period in order to feed the rabbits continuously. Dry matter, ash, crude protein (CP), crude fiber (CF), ether extract (EE), neutral detergent fiber (NDF) and acid detergent fiber (ADF) of maize fodder (at 10th day after planting) and maize seeds were analyzed according to AOAC (2005). Feeding trial was conducted using six New Zealand White, rabbits (4 to 5 weeks old). Rabbits were housed in individual wire net cages. Drinking water was provided freely. The animals were assigned to two groups (Control and HF treatments) based on their body weights. The experimental design was a completely randomized design with three replicates for each treatment. Feeding
trial was done over a period of 4 weeks to compare the feed intakes and growth rate of rabbits fed hydroponically grown maize (HF Treatment) versus Guinea grass (Control). Individual daily feed intake and weekly body weights were recorded during four week period. Differences in the means of weekly dry matter intakes and growth among HF treatment and control were statistically compared by performing Least Significant Difference Test.

RESULTS AND DISCUSSION

Moisture, ash, CP, EE, CF, NDF, ADF, in vitro digestibility % were higher in sprouted maize (73.93, 3.09, 16.54, 6.42, 8.21, 29.27, 10.16, and 79.87%, respectively) than the levels found in seeds (10.26, 1.48,8.21, 4.69, 2.11, 19.22, 5.50, and 68.75%, respectively). Figure 4.4 shows that the mean feed dry matter intakes (270.83g) HF treatment were higher (P<0.05) than in Control (165.42g) during experiment. The weekly body weights increased gradually in both groups during 4 week period (Figure 4.4). Rabbits fed hydroponically grown maize had a higher (p <0.05) body weight gains at 1, 2, 3, and 4 weeks. Feed/gain ratio of HF treatment (1.58g/g) was lower (P<0.05) than in Control (1.89g/g).

CONCLUSION

The nutrient composition (CP, CF, EE, ADF, NDF and ash) and dry matter digestibility of sprouted maize were higher than the maize seeds. Rabbits fed hydroponically grown maize had a greater dry matter intakes, higher body weight gains and lower FCR than those fed Guinea grass.

REFERENCE

A STUDY ON EFFECT OF INLET TEMPERATURE AND FEED PRESSURE ON MILK POWDER QUALITY

M. D. N. Perera¹, R. M. C. Deshapriya¹ and A. R. Dayananda²

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²Pelwatte Dairy Industries Limited, Pelwatte.

INTRODUCTION

Drying of milk has been practiced as a method of preservation of milk from ancient time. Milk powder plays a major role in satisfying the consumer demand of Sri Lankan people for milk. The imports of whole milk powder and non-fat milk powder are annually increasing. Spray dryers are used to transform liquid milk into dried powder by atomizing the liquid milk into steam where moisture is evaporated. During the processing, there are several factors in spray dryer that influence the quality of the milk powder. Birchal et al. (2005) determined optimal settings for several spray drying variables (emulsion feed flow rate of 1.4 kg/h, atomization flow rate of 50,000 rpm, and inlet air temperature of 160 ºC). The consumer acceptability of the milk powder depends on physical, chemical and organoleptic properties. Therefore, this study was done for Pelwatte dairy to improve quality of the milk powder.

MATERIALS AND METHODS

This experiment was conducted at powdered milk plant owned by Pelwatte Dairy Industries Limited, located at Pelwatte, Buttala. In this experiment fresh cow milk was used; the milk was received to Pelwatte plant mainly from Badulla, Bandarawela and Nuwaraeliya areas. After receiving milk, testing’s for adulterants and also for microbiological quality is carried out. Milk was standardized (3.1% fat) and concentrated under vacuum in four effect falling film evaporators with thermal vapor recompression system (total water evaporation rate 4603 kg/h). Concentrated milk (48% total solid) was sprayed in to a two stage dryer (spray dryer and fluid bed dryer) with high pressure nozzle atomization system (total capacity 572 kg/h). The inlet air temperature and feed pressure have been chosen as the operational variables that mainly influence the powder
characteristics. Feed pressures and inlet temperatures were measured using pressure and temperature indicators. Twelve treatments were included with four inlet air temperatures (155 °C, 160 °C, 165 °C, 170 °C) and three feed pressures (55, 60, 65 kg/cm².g). Dryer outlet temperature was maintained at 85±2 °C, fluidized beds hot air inlet temperature at 76±1 °C, cool air inlet temperature at 17±2 °C and dryer and fluidized beds pressure were maintained at -2 mm/wc during the experiment. The milk powder was analyzed for moisture content, titratable acidity, color, bulk density, and wettability. Statistical analysis was carried out using two factor factorial designs with SAS software package and three replicates were used in each treatment. LSD was used to separate means.

RESULTS AND DISCUSSION

Moisture contents were significantly (p<0.05) different in different dryer inlet temperatures except 165 °C, 65 Kg/cm².g feed pressure and 170 °C all the feed pressures. When both dryer inlet temperature and feed pressure were increased the moisture contents were reduced. Titratable acidity were not significantly (p>0.05) different for different temperature and feed pressure varied, and titratable acidity was within the acceptable range. When the dryer inlet temperatures were increased up to 165 °C, color L value was decreased and then increased within further temperature increase. The bulk density and wettability time were not significantly (p>0.05) different within temperature and pressure variables. Bulk densities were reduced within increasing inlet temperature and there was a tendency to reduce wettability time when the inlet temperatures were increased.

CONCLUSION

Most desirable moisture content (<3%) of powdered milk could be achieved at 165 °C inlet air temperature and 65 kg/cm².g feed pressure. Otherwise, the same could be achieved at 170 °C temperature and feed pressure at a range of 55-65 kg/cm².g.

REFERENCE

ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY
OF DRUMSTICK (*Moringa oleifera*) LEAVES IN
HERBAL CHICKEN SAUSAGES

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INTRODUCTION

The quality of meat and meat products degrade as a result of
digestive enzymes, microbial spoilage and fat oxidation and toxic
compounds are produced during deterioration. Murunga (*Moringa
oleifera*) leaves are reported to have a high antioxidant and
antimicrobial activity (Das et al., 2012). The present study was
performed to evaluate incorporation of *Moringa oleifera* leaves
(MOL) in sausage as a natural antioxidant and antimicrobial agent.

MATERIALS AND METHODS

Antioxidant activity and polyphenol content of MOL were analyzed
by 1, 1-Diphenyl 1-2-picryl-hydrazyl (DPPH) method and Folin -
Ciocalteu method, respectively. After preliminary trials, four
concentrations of MOL particles incorporated sausages and and two
controls (with artificial antioxidants and without antioxidants
samples) were used for analysis of TBARS (2-thiobarbituric acid-
reactive substances), pH, microbial population and sesnsory
evaluation. Furthermore, experimental samples were analyzed for
instrumental color evaluation and Water Holding Capacity (WHC).
Experimental design for sensory and other tests was Complete
Randomized Design (CRD). SAS software package was used to
analyze the data. Means were compared using Least Significant
Difference (LSD).

RESULTS AND DISCUSSION

MOL showed a concentration-dependent DPPH radical-scavenging
activity with IC\(_{50}\) of around 100ppm. Median values for sensory
parameters were high (p<0.05) for MOL particles incorporated
sausages in preliminary study. TBARS values were significantly (p<0.05) low in 0.50%, 0.75% and 1.00% MOL incorporated sausage samples compared to the other samples. pH was significantly higher (p<0.05) in 0.25% MOL incorporated sample and in controls compared with other treatments from 2\textsuperscript{nd} week to 5\textsuperscript{th} week. 0.5%, 0.75% and 1% MOL incorporated sausage samples showed significantly low (p<0.001) Total Plate Count (TPC) compared with 0.25% MOL containing sample and controls during 5 weeks of storage period.

![Figure 1: Effect of MOL concentration on TBARS](image1)

![Figure 2: Effect of MOL concentration on TPC](image2)

Highest consumer preference was observed for 0.25% and 0.50% MOL incorporated sausage samples in all sensory aspects.

**CONCLUSION**

Incorporation of 0.5% MOL in chicken sausages showed significant antioxidative capacity and antimicrobial activity without any adverse effect on sensory properties.

**REFERENCES**


ANALYSES OF CADMIUM, NICKEL, ZINC, COPPER AND IRON IN Bicep femoris MUSCLE, LIVER AND KIDNEY OF BEEF AND MUTTON FROM NORTH CENTRAL PROVINCE, SRI LANKA

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INTRODUCTION

Several studies have been done on heavy metal contamination in drinking water, rice etc., in different locations of North Central province, Sri Lanka (Chandrajith et al. 2010). Heavy metal analyses studies for land animals have not yet been done thereby, it is a prevailing necessity to analyze heavy metal levels in organs of cattle and goats reared in North Central Province of Sri Lanka. The current study was conducted with the aim of analyzing Cd, Fe, Zn, Cu and Ni levels in Bicep femoris muscle, liver and kidney of both cattle and goat from North Central province of Sri Lanka.

MATERIALS AND METHODS

Meat, liver and kidney samples of beef and mutton were collected from Dematagoda slaughterhouse. 3-4 g of each samples were cut into small pieces, and freeze dried for 24 hours (FD-U 1200 Freeze Dryer, Tokyo Rikakikaj Co., Ltd., Japan). 0.35g of freeze-dried, powdered samples were subjected to microwave assisted digestion (MLS47100, Milestone Start D Microwave Digestion System, In Vitro Technologies Pvt Ltd., Australia). The digestion mixture contained 9 mL of conc. HNO₃ (69% GR) and 1 mL of 30% w/v H₂O₂. Cadmium was analyzed using Graphite Furnace Atomic Absorption Spectrophotometer (GBC 3000 Scientific Equipment Pvt Ltd, Australia). Nickel, zinc, copper and iron were analyzed by using Flame Atomic Absorption Spectrophotometer (GBC 3000 Scientific Equipment Pvt Ltd, Australia).
RESULTS AND DISCUSSION

The heavy metal concentrations detected in meat, liver and kidney of beef and mutton are summarized in Table 1 and Table 2.

| Table 1. Cd, Ni, Zn, Cu and Fe concentrations of beef samples (mg/ Kg) |
|-----------------|---------|---------|---------|
| Metal type      | Meat    | Liver   | Kidney  |
| Cd              | 0.06± 0.04 | 0.18± 0.08 | 0.93± 0.50 |
| Ni              | 0.83± 0.55 | 1.20± 0.10 | 1.08± 0.55 |
| Zn              | 16.75± 3.40 | 21.95± 2.96 | 20.21± 5.64 |
| Cu              | 1.82± 0.54 | 27.36±22.99 | 11.95± 5.86 |
| Fe              | 77.23±30.52 | 234.48±41.89 | 146.50±44.63 |

| Table 2. Cd, Ni, Zn, Cu and Fe concentrations of mutton samples (mg/ Kg) |
|-----------------|---------|---------|---------|
| Metal type      | Meat    | Liver   | Kidney  |
| Cd              | 0.03± 0.02 | 0.09± 0.04 | 0.18± 0.19 |
| Ni              | 0.55± 0.23 | 0.68± 0.29 | 0.57± 0.31 |
| Zn              | 21.03± 2.74 | 15.89± 0.84 | 13.06± 1.14 |
| Cu              | 2.72± 1.23 | 34.40±28.67 | 12.15± 3.55 |
| Fe              | 59.28±15.98 | 128.65±27.93 | 185.22±32.29 |

In general, Cd concentrations in beef and mutton were not different (P>0.05) when the concentrations of each organ were considered separately. The Cd concentrations of the studied three organs of beef and mutton did not show a significant difference with the age of the animal. In all tested organs and muscle meat, the Cd concentrations were below the maximum permissible levels set for heavy metals in beef and mutton.

CONCLUSION

Meat, liver, kidney samples of beef and mutton collected from North Central Province of Sri Lanka contained Cd levels below the maximum permissible levels. Mean while, the same samples contained high amount of micro minerals such as, Cu, Fe and Zn.

REFERENCE

PRESENT STATUS OF JAFFNA LOCAL SHEEP; THE MORPHOLOGY AND PRODUCTION

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INTRODUCTION

Despite its presence for several hundred years; sheep in Sri Lanka still remains as a neglected species. Almost 90% of the country’s sheep population belongs to indigenous type and they are totally confined to north and eastern regions of the island (Ravindran et al., 1983). The type of indigenous sheep presents in Jaffna is known as Jaffna Local sheep (JLS). Limited attention has been paid on proper identification and characterization of JLS and their management system. Therefore, the present study was conducted to find the phenotypic characteristics of JLS and also to investigate their status in terms of production and farming system.

MATERIALS AND METHODS

The study was conducted in Jaffna peninsula. A total of 70 households were visited in 11 veterinary ranges of Jaffna peninsula to collect information through pre-tested questionnaire. The information were verified by indirect questioning and direct observations. Body measurements (FAO recommended) were obtained from randomly selected 38 adult rams and 43 adult ewes. Descriptive statistics were used to analyze data using Statistical Package for Social Sciences (SPSS version 14).

RESULTS AND DISCUSSION

Almost all the sheep farmers have had primary education (grade 5), and the households shared the responsibility of farming equally between males and females. Only 7.14% of farmers do sheep farming as their main income source, which is coming from renting the sheep for their highly valued manure and the sales of excess lambs and culled adults. The mean flock size is 27.06. Most of the sheep farmers (70%) practiced crop – livestock farming system. Seven percent of farmers rear sheep under semi-intensive management.
system with small number of flock size.

Table 1. Body parameters of Jaffna local sheep

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Adult Rams Mean ± SE (in cm)</th>
<th>Adult female Mean ± SE (in cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012</td>
<td>1984</td>
</tr>
<tr>
<td>Heart girth</td>
<td>73.2 ± 1.1</td>
<td>59.3 ± 2.7</td>
</tr>
<tr>
<td>Height at withers</td>
<td>64.7 ± 0.9</td>
<td>52.4 ± 3.3</td>
</tr>
<tr>
<td>Body length</td>
<td>64.6 ± 1.1</td>
<td>83.2 ± 3.3</td>
</tr>
</tbody>
</table>

According to phenotypic information, there is a tendency for increasing height of local sheep and also to grow big compared to previous observations (Table1) (Ravindran et al., 1983). Unavailability of grazing land and farm labor are the main constrains for sheep farming.

Table 2. Reproduction characteristics of Jaffna local Sheep

<table>
<thead>
<tr>
<th>Reproduction characters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestation period</td>
<td>150 days</td>
</tr>
<tr>
<td>Lambing interval*</td>
<td>6 and 12 month</td>
</tr>
<tr>
<td>Age at 1st lambing</td>
<td>16 month</td>
</tr>
<tr>
<td>Lactation length</td>
<td>3-4 month</td>
</tr>
<tr>
<td>Average weaning age of lamb</td>
<td>4 month</td>
</tr>
</tbody>
</table>

*Two flocks reported the calving interval of 6 month and others (68 farmers) reported as calving interval of 12 month

CONCLUSION

The Jaffna local sheep farming system is crop livestock farming system where sheep are kept mainly for manure, predominantly under semi-intensive management system. There were only five Semi-nomadic type large flocks. Jaffna local sheep is a small breed having distinct characteristics, and are being close-bred for number of years. The population size, the breeding management and the population trends indicate that the population is now in endangered situation and having a considerably high rate of inbreeding.

REFERENCE

PASTEURIZATION OF LIQUID WHOLE EGG ON ITS FUNCTIONAL PROPERTIES AND EXCLUSION OF *Salmonella enterica* SEROVAR Enteritidis

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INTRODUCTION

The incidence of food borne infection with *Salmonella enterica* serovar Enteritidis (SE) via hen eggs has shown a dramatic increase in many countries (Nastasi *et al.*, 1997). Heat treatment is an important factor that influences the survival of pathogens in foods. However, the major functional properties of eggs can be affected by pasteurization. Therefore, the main purpose of this study was to find out the effective whole liquid egg pasteurization time temperature combination and how that would effect on the functional and microbiological quality of the final products under Sri Lankan conditions.

MATERIALS AND METHODS

Homogenized whole liquid egg samples were subjected to three different pasteurization methods: 58 °C, 60 °C and 62.5 °C for 4 min, 3.5 min and 2.5 min, respectively. Pasteurized and unpasteurized whole liquid egg were subjected to evaluation of foaming stability, foaming expansion, emulsification properties, gelling properties, rheological measurement, and colour changes. Butter cakes, prepared using pasteurized and unpasteurized liquid whole egg were used to assess the suitability of pasteurized whole liquid egg in bakery products. Prepared cakes were subjected to sensory evaluation, volume measurement and cake texture measurement. One milliliter of liquid whole egg samples were inoculated with 0.1 mL of 4 log CFU/mL SE inoculum and samples were subjected to pasteurization at 58 °C, 60 °C and 62.5 °C for 4 min, 3.5 min and 2.5 min, respectively. *Salmonella* were enumerated in pasteurized egg samples using Brilliant Green Agar (BG) medium incubated at 37 °C for 24 hours.
RESULTS AND DISCUSSION

Compared to unpasteurized liquid whole egg, pasteurized liquid whole egg had higher (P<0.05) foaming stability, foaming expansion, and gelling properties, but lower emulsification properties. There was no difference (P>0.05) observed between pasteurized and unpasteurized whole egg samples in relation to total colour. Cake prepared with pasteurized and unpasteurized liquid whole egg did not show difference (P>0.05) in appearance, odour, flavor, and overall acceptability. Cakes prepared with 60 °C/3.5 min pasteurized liquid whole egg showed higher (P<0.05) texture likening rate by panelists. The cake, which was prepared by using whole egg subjected to the pasteurization treatment of 62.5 °C/2.5 min showed the most preferred (P<0.05) cake texture by the panelists. Pasteurized liquid whole egg at 60 °C/3.5 min and 62.5 °C/2.5 min showed 100% exclusion of Salmonella colonies; whereas 58 °C/4 min pasteurized liquid whole egg did not eliminate Salmonella completely (2 log CFU/mL).

CONCLUSIONS

Irrespective of the time temperature combinations, pasteurization of liquid whole egg has positive effect on foaming, rheological and gelling properties and a negative effect on emulsification properties. There is no any difference in sensory attributes of cake prepared with pasteurized whole liquid egg and unpasteurized whole liquid egg. Pasteurization of liquid whole egg at 60 °C for 3.5 min and at 62.5 °C for 2.5 min can successfully eliminate the Salmonella enterica Serovar Enteritidis.

ACKNOWLEDGEMENT

Authors wish to thank Mr. Zaffar Jeevunjee, Senior Executive Officer and staff at the Switz Lanka (Pvt) Ltd and staff for proving assistance for this study and for the useful suggestions.

REFERENCE

EFFECT OF FLOOR SPACE ALLOWANCE DURING TRANSPORTATION ON BEHAVIOUR, WELFARE AND MEAT QUALITY OF SLAUGHTER WEIGHT PIGS

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INTRODUCTION
Transportation of pigs from farm to abattoirs is an essential component in swine marketing and processing. However, it generates a substantial stress on animals, resulting in animal welfare challenges for the industry. A number of studies have been conducted to evaluate effects of transportation on welfare of pigs and its’ impact on meat quality. Journey times (durations) and conditions, trailer design, temperature both inside and outside trailer, and floor space allowance are known significant factors that influence welfare of pigs during transportation (Warris, 1998). The main objective of the present study was to identify a suitable floor space allowance during transportation of market weight pigs under Sri Lankan conditions to minimize stress and thereby to optimize welfare of pigs and minimize losses in carcass and meat quality.

MATERIALS AND METHODS
A standard commercial livestock trailer was used to transport pigs. Three different floor space allowances (0.50 m²/pig (T1), 0.45 m²/pig (T2) and 0.42 m²/pig (T3)) were used in the study. Each floor space treatment was replicated three times. Pigs were starved for a period of 12 hours before transportation and were transported 38 km, for approximately 1.5 hours. Behaviours during loading, transportation, unloading and while waiting at the holding area (approximately for 1.15 hours) were observed. Blotchiness of the skin and injuries to the pigs were evaluated before and following transportation. The temperature inside (front) and outside the trailer was monitored at five-minute intervals during transportation and at the end of the journey severity of breathing as an indicator of stress imposed during transportation was evaluated. Damages to the carcass, and pH (1, 3 and 24 hours following slaughter) and meat colour (24 hours following slaughter) were studied. The data were analyzed using the
General Linear Model (GLM) procedure of SAS. The differences between the means were evaluated with least significant difference (lsd) means separation.

RESULTS AND DISCUSSION

There was no difference (p>0.05) in inside or outside trailer temperature during transportation among three treatments. The behaviours (balk, turnaround, backward, backup, under lap, overlap, slip and vocalization) at loading and unloading were not affected (p>0.05) by treatments. The blotchiness score before and following transportation and injuries before transportation were also not affected (p>0.05) by floor space treatment. However, injuries and carcass damages following transportation was significantly higher for the T3 compared with T1 and T2 (p<0.05). Even though it was not significant, some difficulty in breathing in pigs following transport was observed in T2 and T3. pH of the meat following slaughter at 1 and 3 hours and the meat colour was similar among the treatment. Although, pH 24 hours following slaughter was lower (p=0.05) for the T2 and T3 compared with T1, the values for the three treatments were within the acceptable levels. According to the ‘Japanese Pork Colour Standards’ chart, all the treatment meat samples could be categorized as RFN meat (Reddish pink, Firm and Non-Exudates).

CONCLUSION

Pre-slaughter and carcass injures significantly increased when the floor space allowance was 0.42 m²/pigs during transportation. Since there was no differences between treatment 1 (0.50 m²/pig) and treatment 2 (0.45 m²/pig) with respect to compromising welfare during transportation and quality of meat following slaughter, a cost effective floor space for the transportation of pigs can be concluded as 0.45 m²/pig.

REFERENCE

DEVELOPMENT OF A READY TO EAT CHICKEN AND VEGETABLE MIX PIE WITH ARROWROOT (Maranta arundinacea) FLOUR INCORPORATED CRUST

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INTRODUCTION

Consumers tend to search for convenient food items. Thus, it would be interesting to investigate the possibilities of developing a ready to eat chicken and vegetable mix pie with desirable keeping qualities. Arrowroot (Maranta arundinacea) flour has relatively low glycemic index, high dietary fiber level, and it is free from gluten protein. Also arrowroot flour has been used for therapeutic applications (Lajvardi et al., 1993). Therefore, the objective of this study was to develop a ready to eat nutritionally balanced, healthy, chicken meat pie with arrowroot-incorporated crust.

MATERIALS AND METHODS

Arrowroot rhizomes were washed properly and cut into small pieces and oven dried at 40 °C for 4 hours. After that, it was ground and sieved in order to get arrowroot flour. The meat pie crust was prepared by replacing different levels of wheat flour with arrowroot flour (20%, 30%, 40%, 60%, 70% and 80%). Four preliminary trials were conducted to select the best level of vegetables, boneless meat, mechanically separated meat and sauce graveness for the pie filling. Sensory evaluation was conducted with three final products containing three different sauces. The selected final product was evaluated for thiobarbituric acid reactive substance (TBA) analysis, pH, and water holding capacity (WHC) and microbiological analysis for 15 days at – 18 °C.

RESULTS AND DISCUSSION

The best replacement level of wheat flour by arrowroot flour was 40% for the pie crust. The pie filling incorporated with 50% boneless
chicken meat, 30% vegetables and 20% sauce was selected as the best recipe. Among three types of sauces (tomato sauce prepared with tomato paste, oyster and Worcestershire) tested, tomato sauce prepared with tomato paste was selected as the best sauce to be incorporated to meat pie filling mix. It obtained the highest overall acceptability and no differences (p<0.05) were observed with the other sensory attributes of pies prepared with two other sauces (Figure 1).

![Spider web analysis on effect of incorporating different sauces to chicken vegetable meat pie filling mix on different sensory attributes.](image)

**Figure 1:** Spider web analyses on effect of incorporating different sauces to chicken vegetable meat pie filling mix on different sensory attributes.

TBA value and WHC of the final product did not change within 15 days of storage period. Microbial counts of the product were less than microbiological limits of Sri Lanka Standards Institution.

**CONCLUSIONS**

Meat pie crust can be replaced with 40% arrowroot flour successfully. The pie filling mix with 50% boneless chicken, 30% vegetable and 20% sauce (prepared with tomato paste) can be effectively used to prepare a meat pie with attractive sensory attributes.

**REFERENCE**

PREVALENCE AND SOME EFFECTS OF LUMINESCENT BACTERIA PRESENT IN *Penaeus monodon* (BLACK TIGER SHRIMP) CULTURED WATER SOURCES AND SEMI-INTENSIVE POND SYSTEMS IN PUTTALAM DISTRICT

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INTRODUCTION

Aquaculture is the fastest growing food sector globally and has established itself as a high protein resource to fulfill the food demand. At present, the main problem faced by the aquaculture industry worldwide is disease caused due to various biological and non-biological agents. Among the groups of microorganisms that cause serious losses in shrimp culture, the best known are virus and bacteria, because of the devastating economic effects they have on affected farms. Among the bacterial diseases luminescence shrimp disease cause mass mortalities, reduced appetite, reduced growth rate and increase disease susceptibility in hatcheries (Kannapiran, 2009). This study was done to identify presence of luminescent bacteria in grow-out pond systems and main water sources and the effect of luminescence on survival rate and production.

MATERIALS AND METHODS

Six water sources (Puttalam lagoon, Chilaw lagoon, Mundel lagoon, Dutch canal, Daduru Oya and Tube well) and two-hundred ponds were selected and subsurface water samples were randomly taken from each water source and pond at four week intervals. Water samples were taken to 125mL sterile bottles taking necessary precautions to avoid cross contaminations. These samples were marked and stored in cool polystyrene boxes and samples were transported to the laboratory before 6 hours from collection. Then 0.1mL of samples was cultured on Thiosulphate Citrate Bile Salt Sucrose agar plates and incubated for 24h. Using a dark room identify the presence or absence of luminescent bacteria. Then according to water source, % of luminescence was calculated. In addition, salinity of water samples were taken using refractor meter
and the survival rate and production of shrimps with and without luminescence ponds around Puttalam lagoon were taken to identify the effect of luminescence on survival rate and production. Data were analyzed using linear regression and unpaired t-test at p<0.05 significant.

RESULTS AND DISCUSSION

In Puttalam district, 32.5% of ponds had been affected with luminescent bacteria and from the Puttalam lagoon water analysis 50% contained luminescent bacteria. However tube-well and Daduru-oya water samples did not have luminescence positive samples. There was a linear relationship between presence of luminescence in water sources and ponds (p=0.003) with the correlation coefficient of 0.913. According to unpaired t-test results, there was a significant difference between mean of survival rate in ponds with and without luminescence (p=0.002). As well as there was a significant difference between mean of production in ponds with and without luminescence (p=0.003). There was a positive linear relationship between salinity and percentage of luminescence in ponds (p<0.05) with the correlation coefficient of 0.925. *Vibrio harveyi* grow well under high salinity level (Lendriana, 2004).

CONCLUSION

According to this study, coastal line around the Puttalam district is contaminated with luminescence bacteria. In order to control this problem, shrimp farmers should use ground water or water from Daduru oya or water must be purified to ensure that water does not contain harmful luminescent bacteria. Presence of luminescent bacteria, significantly reduce the total production and survival rate.

REFERENCES


COMPARISON OF GROWTH, YIELD AND NUTRITIVE VALUE OF MAIZE, MULTI-CUT FODDER SORGHUM AND HYBRID NAPIER (VAR. CO3) GROWN IN WET ZONE OF SRI LANKA

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INTRODUCTION

Less availability of good quality green forages is a main constrain for dairy development in Sri Lanka. Introduction of high yielding fodder varieties is one of the strategies that can be adopted to increase the animal feed resources and enhance milk production of the country. Currently, information of fodder crops as feed sources for ruminants under local conditions is lacking. The present study was conducted to evaluate and compare the yield and nutrient composition of maize, multi-cut hybrid fodder sorghum (BMR6 and Sugargraze) and Hybrid Napier (Var. CO-3) grasses grown under wet zone conditions in Sri Lanka.

MATERIALS AND METHODS

Cultivation of hybrid Napier variety CO-3, hybrid sorghum varieties (BMR6 and Sugargraze) and maize (Rambo variety) was carried out in Gannoruwa, Sri Lanka. Four varieties were arranged in a Randomized Complete Block Design with three replicates. Plots were harvested 2 months after establishment. For each variety, nine plants from each plot were randomly selected to measure the growth. Fresh matter yield of forage crops in each plot was measured. At 45 days after planting, sub samples of forage were taken separately for each fodder variety. The samples were analyzed for dry matter (DM), crude protein (CP), Ash, Ether extract (EE) and Crude fiber (CF) according to AOAC (2005) procedures. Neutral detergent fiber (NDF) and acid detergent fiber (ADF) were determined as described by Van Soest et al., (1991). In vitro dry matter digestibility (IVDMD) was determined according Tilley and Terry method (1963).
RESULTS AND DISCUSSION

Mean plant heights among fodder varieties were 172, 199, 208 and 218 cm respectively, for CO-3, maize, BMR-6 and Sugargraze. Dry matter yield among forages were 3557, 3657, 4772 and 5230 kg/ha/cut, respectively for maize, CO-3, BMR6 and Sugargraze. The IVDMD values among forages were 58.15, 60.87, 69.92 and 72.96% respectively for CO-3, Maize, Sugargraze and BMR6.

Table 1. Nutrient Composition of fodder varieties

<table>
<thead>
<tr>
<th>Variety</th>
<th>DM</th>
<th>CP</th>
<th>CF</th>
<th>EE</th>
<th>Ash</th>
<th>NDF</th>
<th>ADF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO3</td>
<td>12.03</td>
<td>16.32</td>
<td>31.11</td>
<td>6.71</td>
<td>12.22</td>
<td>62.68</td>
<td>35.04</td>
</tr>
<tr>
<td>Maize</td>
<td>11.58</td>
<td>16.33</td>
<td>32.49</td>
<td>4.13</td>
<td>8.93</td>
<td>60.15</td>
<td>36.68</td>
</tr>
<tr>
<td>BMR 6</td>
<td>12.85</td>
<td>18.05</td>
<td>25.67</td>
<td>5.21</td>
<td>12.08</td>
<td>67.68</td>
<td>40.43</td>
</tr>
<tr>
<td>Sugargraze</td>
<td>12.66</td>
<td>17.12</td>
<td>32.23</td>
<td>5.97</td>
<td>11.41</td>
<td>67.55</td>
<td>40.12</td>
</tr>
</tbody>
</table>

Means in a column with different superscripts are significantly different (P<0.05). All values are in percentages (%)

CONCLUSION

Growth, yield and nutrient composition of maize (Rambo) and hybrid fodder sorghum varieties (BMR6 and Sugargraze) are equal or superior to hybrid Napier variety CO-3 under wet zone conditions of Sri Lanka.

REFERENCES


DEVELOPMENT OF A CHICKEN SAUSAGE USING NATURAL COLORANT OF ANTHOCYANINS EXTRACTED FROM Hibiscus rosasinensis (RED LAYERED Hibiscus) FLOWERS

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INTRODUCTION

Color is one of the most important quality attributes affecting the consumer's acceptance of food. Nitrates and nitrites are used in meat products in order to fix the red color of meat products. Anthocyanin is a natural colorant which is widely present in the plant sources. Hibiscus rosa-sinensis flowers contain anthocyanins which give it characteristic deep red color. However, no studies have been conducted to detect the effect of adding anthocyanin extracted from H. rosasinensis flowers to chicken sausages. This study was carried out to assess the effect of incorporating anthocyanins extracted from Hibiscus rosa-sinensis flowers on sensory properties and physico-chemical properties in chicken sausages.

MATERIALS AND METHODS

Extraction of anthocyanin was carried out using the method as described by Vankar and Shukla, (2011) with slight modifications. Petals of the H. rosasinensis flowers were cut into small pieces and thoroughly mixed with 200 mL of 95% (w/v) ethanol in 500 mL conical flask and kept for 3 hours at room temperature with stirring. The mixture was filtered using Whatman No 1 filter papers. The combined filtrates were then concentrated using Rotovapor at 55 °C and powdered Hibiscus extract was obtained after freeze drying. Then, six batches of sausages were produced and first five batches were produced using different amount of extracted anthocyanins (0.05% (T1), 0.1% (T2), 0.15% (T3), 0.20% (T4) and 0.25% (T5)) with 0.1% citric acid and 6ᵗʰ batch was produced using 60 ppm of NaNO₂ (T6). Overall consumer performance for color, juiciness, taste, texture and overall acceptability were determined using 30 trained panelists. Color, pH, water holding capacity, 2-thiobarbituric
acid-reactive substances were analyzed on the 1\textsuperscript{st}, 2\textsuperscript{nd} and 3\textsuperscript{rd} weeks after production of sausages. Total plate count was carried out on the 1\textsuperscript{st}, 2\textsuperscript{nd}, and 3\textsuperscript{rd} weeks after production of sausages.

**RESULTS AND DISCUSSION**

Sensory evaluation results showed that 0.05% anthocyanin + 0.10% citric acid incorporated sausage samples and reference samples were not different (P>0.05) for all the sensory attributes.

**Table 1.** Mean L, a, b values of sausages incorporated with different level of anthocyanin extracts from *H. rosasinensis* and NaNO\textsubscript{2} incorporated sausages.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Mean L value for external color of sausages</th>
<th>Mean a value for external color of sausages</th>
<th>Mean b value for external color of sausages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wk</td>
<td>Wk</td>
<td>Wk</td>
</tr>
<tr>
<td>T1</td>
<td>26.7\textsuperscript{a}</td>
<td>27.9\textsuperscript{b}</td>
<td>30.5\textsuperscript{a}</td>
</tr>
<tr>
<td>T2</td>
<td>31.6\textsuperscript{b}</td>
<td>32.5\textsuperscript{c}</td>
<td>34.1\textsuperscript{c}</td>
</tr>
<tr>
<td>T3</td>
<td>35.1\textsuperscript{c}</td>
<td>35.5\textsuperscript{d}</td>
<td>36.1\textsuperscript{d}</td>
</tr>
<tr>
<td>T4</td>
<td>38.1\textsuperscript{d}</td>
<td>38.3\textsuperscript{e}</td>
<td>39.3\textsuperscript{e}</td>
</tr>
<tr>
<td>T5</td>
<td>39.1\textsuperscript{d}</td>
<td>39.1\textsuperscript{f}</td>
<td>39.5\textsuperscript{e}</td>
</tr>
<tr>
<td>Ref</td>
<td>27.1\textsuperscript{a}</td>
<td>27.1\textsuperscript{a}</td>
<td>27.8\textsuperscript{a}</td>
</tr>
</tbody>
</table>

*Different letters within each column indicate significant differences at P<0.05.*

The highest effect with substitute of NaNO\textsubscript{2} in colour development (L, a, b values) of chicken sausages had 0.05% anthocyanin + 0.1% citric acid incorporated sausage samples (Table 4.8). Increasing level of anthocyanin extract resulted in reduction (P<0.05) of vial counts in sausage.

**CONCLUSIONS**

The optimum level of anthocyanin extract to be incorporated in to the sausage mixture is 0.05%, maintaining its sensory attributes, physiochemical and keeping quality properties. *Hibiscus rosasinensis* extract has a significant effect on reduction of total vial count in sausages.

**REFERENCE**

ANALYSIS THE POTENTIALS OF AGRO TOURISM AS THE NEW ELEMENT OF TOURISM AND COMMUNITY DEVELOPMENT IN SIGIRIYA AREA

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INTRODUCTION

Agro tourism is a holiday concept of visiting an agribusiness operation for the purpose of enjoyment, education or involvement in the activities of the operation. Today tourism is one of the most fastest growing industry in the world. In Sri Lanka, it growing and changing very rapidly. After the 30 years of war tourist arrivals and investing to the tourist industry by government and privet sector is increased. In tourism there are different types of concepts. Due to the demand, different countries adopting different concepts with available recourses. Now there is a big trend among the tourists to engage with alternative tourism. Sri Lanka is an agricultural country also with great tourist attraction. Thus Implementation of agro tourism is a good way to develop both living standards of the farmers and tourist sector. Sigiriya is one of the top tourist destinations in the world. Hence many tourists visit to see that form all over the world. And Sigiriya area is belongs to Matale district which having great agricultural back ground.

MATERIALS AND METHODS

The Sigiriya was selected purposively as a study area. Primary data were gathered through by surveying farmers through random selection with 50 total sample size and discussions were carried out with different hotels professionals, governmental professionals, tourists. Secondary data was gathered from the Tourist Hotels, Grama Niladhari Division, Sri Lanka Tourism Development Authority, Central bank report. Data collection period was 2 month and statistical software for social science (SPSS) were used for the data analysis procedures.
RESULTS AND DISCUSSION

Average tourist accommodated of the area was around 10000 per month. Out of total population 80% engaged with farming and 58% of population only does farming as the livelihood. Average land availability per farmer was 3.05 acre. They cultivated upland and lowland crops such as vegetables, fruits, cereals, main crop is paddy also Chena cultivation was a prominent feature. In additionally 40% of total population was rearing livestock including cattle, buffalos, poultry and fishing activities were presence in the tanks. Awareness in agro tourism very poor was about 20%. Out of the population 78% were willing to join with the agro tourism. Average tourist arrivals to the villages were 168 per month but extra income from the tourist industry was less.

CONCLUSION

Sigiriyaa area is one of the top tourist’s destinations in the country. Area is rich with agricultural and natural landscapes. There are enough potential to implement the agro tourism as an industry. Also sound panning system for tourism and education system of for villagers is an essential factor. Tourist hotel and government sector should take the priority for the planning process. Understanding tourist arrival pattern, Infrastructure facilities and financial support for farmers is most important things at initiating the industry.

REFERENCE


IN VITRO DIGESTIBILITY OF HYBRID SORGHUM, MILLET, HYDROPONICALLY GROWN MAIZE AND THE INFLUENCE OF PROBIOTIC YEAST (Saccharomyces cerevisiae) CULTURE ON DIGESTION OF FORAGES

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INTRODUCTION

Hybrid fodder sorghum, millet and maize are newly introduced fodder varieties in Sri Lanka. Currently there is no information on the digestibility of these fodder varieties grown under local conditions. Also, scientific evidence on the influence of yeast probiotics on rumen fermentation and digestibility of these forages is lacking. This study was designed to determine the in vitro digestibility of cultivars of sorghum, millet and hydroponically grown maize. The effect of adding probiotic yeast culture on the in vitro digestibility of these feed resources was also investigated.

MATERIALS AND METHODS

Experiment 1 was carried out to determine the in vitro digestibility of three hybrid fodder sorghum varieties (Sugargraze, BMR-6, Jumbo, F8421), a millet variety (Nutrifeed) and hydroponically grown maize fodder harvested at 7, 10, 14 days after germination and maize seeds. In vitro dry matter digestibility (IVDMD) and in vitro organic matter digestibility (IVOMD) were estimated using the Tilley and Terry two-stage digestibility method (1963). Experiment 2 was done to evaluate the effect of adding rumen specific strain of live yeast Levucell® SC-1077 culture on in vitro digestibility of two forage varieties (Jumbo Sorghum and Nutrifeed Millet) that had lower digestibility values in experiment 1, Brachiaria brizantha and maize seeds. The feed samples were incubated in rumen fluid obtained from a slaughtered steer (Run 1) and a slaughtered goat (Run 2) with and without adding Levucell® SC-1077 live yeast culture.
RESULTS AND DISCUSSION

IVDMD% of maize seeds, hydroponic maize fodder harvested at 7, 10, 14 days and Sorghum/Millet varieties (Sugargraze, BMR-6, Jumbo, F8421, Nutrifeed) were 70.7, 76.9, 75.4, 67.6, 58.9, 60.6, 55.7, 58.9 and 57.5 respectively. IVOMD% of maize seeds, hydroponic maize fodder harvested at 7, 10, 14 days and Sorghum/Millet varieties (Sugargraze, BMR-6, Jumbo, F8421, Nutrifeed) were 69.6, 74.9, 73.6, 65.5, 52.7, 55.1, 49.1 and 51.1 respectively. Hydroponically grown maize fodder at 14 days of harvest had lower (p<0.05) IVDMD and IVOMD values than those at 7 and 10 day harvest and maize seeds. The IVDMD of sorghum and millet varieties ranged between 55.7% (Jumbo) and 60.6% (BMR-6). The IVOMD values varied from 49.1% (Jumbo) and 55.1% (BMR-6).

Addition of yeast probiotic appeared to improve fermentation and increased the digestibility of forage.

CONCLUSIONS

In vitro digestibility of hydroponically grown maize fodder harvested between 7 to 10 days was superior to original grain and those harvested at 14 days. Supplementation of yeast probiotic (Levucell®SC-1077) had positive influence on in vitro digestibility of forages

REFERENCES

EFFECT OF HIGH WATER TEMPERATURE & DIFFERENT CONCENTRATION OF METHYL TESTOSTERONE (ANDROGEN HORMONE) ON SEX INVERSION OF NILE TILAPIA (*Oreochromis niloticus*) UNDER IMMERSION TECHNIQUE

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INTRODUCTION

Tilapia is the ninth most important species of world aquaculture production. Early reproduction is the major impediment in Tilapia pond fish culture. Spawning in rearing ponds gives large number of small fry that stunting the entire tilapia population which causes to considerable loss of expected yield and economic profitability. To overcome above mentioned problems culturist can practice mono-sex culture. Male has faster growth and larger body size and they become sexual maturity at late. Therefore, all male culture is the best method than all female or mix culture in tilapia aquaculture. There are several methods to produce all male tilapia population. Amongst, hormonal sex reversal is the most commonly used method. It is possible to inverse entire or majority of female fry in to effective male by giving exogenous steroids during labile period. In this process, Methyltestosterone (MT) is the most commonly used androgen to inverse the sex of tilapia.

MATERIALS AND METHOD

Experiment was conducted in CIC Agribusiness Center Palwehera. Hormonal immersion technique was practiced for all treated fish, except control in experiment. Fry at 11th and 13th days after post fertilization were immersed 3 hours time period for each day in concentration of 500 µg/L, 750 µg/L and 1000 µg/L hormone solutions at 36 ± 0.5 ºC temperatures as treatments. Each treatment has three replicate. Fry density was maintained at 75 fry/L during immersion. Then treated fry were placed in 12 hapas as 50 fry/ hapa and feeding (30% CP) was done according to body weight After 14 weeks of culture period sex identification was done under the microscope using aceto carmine squash mount method.
RESULT AND DISCUSSION

Figure 4.1: Male Tilapia percentage with different concentrations of 17α-MT at 36 °C Temperature.

Results showed that there is a significant (P<0.05) difference between control and treatments. According to result, 1000 µg/L 17α MT at 36 ± 0.5 °C has resulted 97.34% (P<0.05) male population while 750 µg/L and 500 µg/L hormone concentrations have resulted 93.34% and 89.34% male population, respectively. Among different concentrations of MT used, 1000µg/L concentration resulted the highest percentage (97.34%) of male tilapia population while control gave lowest (58.67%).

CONCLUSION

All male Tilapia population (>95% male population) can be achieved by using 1000µg/L of 17α MT at 36 ±0.5°C of water temperature under hormone immersion technique in Sri Lankan conditions. Before applying this technique in operation, it is suggested to analyze the consistency of this result with analyzing cost benefits of this technique for all male Tilapia production.

REFERENCE

DEVELOPMENT OF READY TO EAT CHICKEN MEAL FOR OUTLETS

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INTRODUCTION

The Chicken meat industry has occupied a leading role among Agricultural industries in many part of the world in recent years (Dagher, 1995). Chicken meat can provide significance health benefits for humans. Therefore it can help to find the better solution for protein malnutrition. Today relatively large numbers of women are employed outside the home and they look for products, which are convenient. So it is very reasonable and important to produce ready to eat products and this study was planned to develop a ready to eat chicken meal by using chicken breast meat.

MATERIALS AND METHODS

Market survey was conducted by using 70 randomly selected responders. According to the results of the preliminary trials and the survey, different recipes were developed. Initially breast meat was seasoned with the mixture of spices and allowed to stand for 30 minutes in the refrigerator at 10\textdegree C. All the vegetables were cut in to 1 X 3 cm small pieces. After seasoning meat was cooked at 75 \textdegree C by adding required amount of water for about 25-30 minutes. All the vegetables were fried at 175\textdegree C temperature in a cooking pan. Then both cooked meat and fried vegetables were mixed together to prepare final products. Final products were subjected to objective analysis such as pH, thiobarbituric acid reactive substances value (TBARS), total Plate Count (log CFU/mL) and colour at 1\textsuperscript{st}, 2\textsuperscript{nd}, 3\textsuperscript{rd} and 4\textsuperscript{th} week of storage at -18 \textdegree C. Sensory properties including Appearance, color, aroma, taste, texture and overall acceptability were evaluated after preparing the meal. Sensory data were analyzed using Friedman non-parametric test. Keeping quality data were analyzed using complete Randomized Design. Cost analysis and cooking yield of the final products were measured initially.
RESULTS AND DISCUSSION

According to the survey, more than 50% of the consumers were willing to eat chicken meat, and preferred to add meat in small pieces. However, moderately hot, garlic, paper and sweet taste were preferred by the consumers. Most of the responders were preferred to have carrot, potato, Mushrooms and Beans in the meal, as well as like to pay 120-150 rupees for the meal. Chicken meal No.225 was given highest score for Appearance, Colour, Aroma, Texture and Overall acceptability. Chicken meal No.225 was shown lowest antioxidant properties during storage period at -18°C. Moreover Chicken meal No.364 was shown lower (P<0.05) pH values than Chicken meal No.437 and Chicken meal No.225. According to the result of total plate count, Chicken meal No.437 was shown lower values than other two products during storage period. Also there were no significant differences in L and b values in all the samples throughout the storage period. Highest cooking yield was observed in Chicken meal No.437 (79.37%) while cost of production of 1 Kg of Chicken meal was highest in Chicken meal No.225.

![Spider web diagram of the final three products](image)

**Figure 1:** Spider web diagram of the final three products

CONCLUSIONS

Chicken meat is the most preferred meat type while Carrot, Potato beans and Mushrooms are the most preferred vegetable items. Chicken meal No.225 has given good sensory attributes but cost of production is very high.

REFERENCE

PARTIAL REPLACEMENT OF SALT WITH COMBINATION OF POTASSIUM CHLORIDE, POTASSIUM LACTATE AND CALCIUM ASCORBATE IN CHICKEN SAUSAGES

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INTRODUCTION

Intake of dietary sodium has been linked to hypertension and consequently increases the risk of cardiovascular disease. Currently the daily adult intake of sodium is approximately three times the recommended daily allowance and therefore public health and regulatory authorities are recommending reducing dietary intake of sodium to 6 g salt per day (Desmond, 2006). Processed meat products comprise sodium as one of the major ingredients in the form of sodium chloride (salt). Salt has an essential function in meat products in terms of flavor, texture and shelf-life. Currently there are a number of approaches to reduce the sodium content in processed meat products including the use of salt substitutes. Thus present study was carried out to determine the best salt replacement combination for the chicken sausages.

MATERIALS AND METHODS

Experiment was designed to replace 40% of sodium chloride in chicken sausages with 40% KCl or three different combinations of potassium lactate (KL) and calcium ascorbate (Ca-A) (Control T1-100% NaCl, T2-60% NaCl+40%KCl, T3-60%NaCl+30% KL+10% Ca-A, T4-60%NaCl+20% KL+20% Ca-A, T5-60%NaCl+10% KL+30% Ca-A). Following a preliminary trial most preferred three treatments by consumers were selected for the further analysis. Selected three treatments were compared with the control in the sensory evaluation. Furthermore, pH, water holding capacity (WHC), 2-thiobarbaturic acid-relative substances (TBARS) value, texture, inner and outer color of the sausages were measured in the treatments and control.
RESULTS AND DISCUSSION

Salt replacement with 40% KCl (T2), 30% KL+10% Ca-A (T3) and 20% KL+20% Ca-A (T4) were selected from preliminary study. As shown in figure 1, when KL and Ca-A combinations were used as salt replacers appearance, color, taste, texture and overall acceptability were not affected while, replacing 40% NaCl with KCl none of the characteristics were significantly different (p>0.05) compared to control treatment.

Figure 1: Spider web analysis of sausages for sensory characteristics
T1- Control treatment, T2- 60%NaCl+40%KCl,
T3-60%NaCl + 30%KL+10%Ca-A,
T4-60%NaCl+20%KL+20%Ca-A

Furthermore, pH, texture and WHC in treatments were not significantly different compared to the control treatment. TBARS values of all treatments were not significantly different (p<0.05) throughout the storage period. However, salt replaced treatments resulted less lightness and yellow color development at the end of the storage period.

CONCLUSION

Replacement of 40% NaCl either with KCl or with a combination of KL and Ca-A did not affect the sensory, chemical and physical properties.

REFERENCE

DEVELOPMENT OF A PURPLE SAUSAGE USING NATURAL COLOURANTS

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INTRODUCTION

Sausage is a protein enriched, convenient product which can use to uplift nutritional status of children (Xiong et al., 2007). Colour is the major quality attribute of sausages and synthetic colourants are used in sausage production. Image of natural colourants are better than synthetic colourants due to their less toxic effect. Anthocyanins (ACNs) are plant pigments which responsible for purple colour. Raja ala and Maha Bowitiya are locally available plants. Raja ala tuber and Bowitiya fruit contains high level of ACNs with high potential as natural colourants which can use in sausage production. The present study was conducted to assess the potential of Raja ala and Bowitiya fruit as a natural colourant on physico-chemical and sensory properties including colour development in chicken sausage.

MATERIALS AND METHODS

First two basic trials were conducted to find the best type of colourant. Three batches of sausage were produced with Raja ala extract, Maha bowitiya extract and Raja ala powder. Other ingredients were same in all three products. Stability of purple colour of selected Raja ala powder incorporated sausage was improved by adding citric acid (0.06%). Then combination effect of Raja ala extract and powder was tested by replacing chilled water by colour extract (T1= 50%, T2=100% (w/w)). Then, three batch of sausage samples were produced with 1.8% (sample582), 2.7% (sample 823) and 3.6% (sample157) of Raja ala powder and 50% of chilled water is replaced by colour extract in every batch. Finally sensory evaluation was conducted to evaluate flavour, colour, texture, odour, appearance and overall acceptability using thirty untrained panelists. Colour (L, a, b), pH, TBAR, WHC of samples were measured during storage at 4ºC for 12 days. For above analysis, sunset yellow colourant (0.3%) added sample was used as control. Data were analyzed using one way ANOVA and Friedman non-parametric test.
RESULTS AND DISCUSSION

According to sensory evaluation, sample 157 showed highest median values with respect to colour, taste, texture, odour and overall acceptability. In keeping quality analysis, Colour (L, a) values and TBAR values were increased significantly and pH, WHC and Yellowness values were reduced significantly for all treatments during the storage. Moreover, sample 157 had higher (P<0.05) colour (L, a) value and TBAR values over other 3 samples. Yellowness (b) and pH were higher (P<0.05) in control sample than all other samples. Sample 157 had high value for WHC, but it was not significantly different. In proximate analysis, sample 157 was given higher (P<0.05) values for crude protein, crude fat, dry matter.

![Figure 1: L and a* values of the sausages during the storage.](image)

CONCLUSION

Raja ala (*D. alata*) can be used successfully as good attractive purple colourant for the production of chicken sausage. Raja ala powder could be incorporated into sausage was 3.6% of the Rusk powder content. It supports to maintaining sensory attributes, physicochemical properties.

REFERENCE

DEVELOPMENT OF ALOE VERA (*Aloe barbadensis* Miller) INCOPORATED CHICKEN SAUSAGE

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INTRODUCTION

With increasing intake of meat and fish health risks also increase since the meat and fish contain high amount of saturated fatty acids (Patricia, 1983). One solution for the above problem is producing functional meat products. Aloe vera (*Aloe barbadensis*) is a medicinal plant. It has been claimed that the polysaccharides in Aloe vera gel have therapeutic properties such as immune stimulation, anti-inflammatory effects, wound healing, antibacterial, anti-viral, anti-fungal, anti-diabetic, and anti-oxidant effects (Davis 1997). This study was conducted to determine the suitability of incorporation of Aloe vera gel as a water replacer in chicken sausages and its contribution to the enrichment of medicinal value.

MATERIALS AND METHODS

The product development was carryout in Sausage production plant of Nelna Farm pvt Ltd. Normal chicken sausage recipe available in Nelna Sausage plant was considered as reference sample (T-5). Water in the reference batch was gradually replaced with four treatment levels (25% (T-4), 50% (T-3), 75% (T-2), 100% (T-1)) of Aloe vera gel. Sensory evaluation was conducted to evaluate flavour, colour, texture, odour, appearance and overall acceptability using thirty untrained panellists. Objective evaluations such as pH, thiobarbituric acid reactive substances value (TBARS), water holding capacity, and colour of sausage samples were taken during consecutive four weeks of storage at -18 °C.

RESULTS AND DISCUSSION

Sensory data revealed that consumers preferred 75% and 100% Aloe vera gel incorporated chicken sausages with respect to appearance, aroma, texture, taste, juiciness and overall acceptability. During the storage period Treatment one and two showed lowest pH value (pH-6.50 and 6.52 respectively) while reference sample showed highest pH value (pH=6.58). Treatments 1, 2 and 3 have significantly low TBAR values (2.80, 2.82 and 2.88 mg malonoldhyde/kg respectively) when compared to reference sample (3.13 mg malonoldhyde/kg).
Water Holding Capacity and Color value of all sausage samples significantly reduced (P<0.05) during the storage period. Proximate analysis clearly illustrated that there was no significant effect on crude fat, moisture and dry matter content but there was a significant difference in fiber and protein content among treatments (P<0.05). Treatments 1 and 2 contain high amount of crude protein and crude fiber content when compared to reference sample. Total plate count of all five treatments increased throughout the storage period. Significant difference among the treatments was also noticed where treatments 1 and 2 had lowest value for total plate count. It might be due to the antimicrobial activity of Aloe vera gel.

![Figure 1: Total Plate Count (TPC) of sausages during the storage period at -18°C.](image1.png)

**Figure 1:** Total Plate Count (TPC) of sausages during the storage period at -18°C.

![Figure 2: TBAR value of Sausages during the storage period at -18°C.](image2.png)

**Figure 2:** TBAR value of Sausages during the storage period at -18°C.

**CONCLUSIONS**

The study suggested that Aloe vera gel is a good source of natural anti oxidant and antimicrobial agent and incorporation levels of 100% and 75% were more effective in terms of sensory attributes, physicochemical and keeping quality properties.

**REFERENCE**

A PRELIMINARY STUDY ON THE PERCEPTION OF HOME GARDEN WILD ANIMALS AMONG RURAL AND URBAN PEOPLE OF SRI LANKA.

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INTRODUCTION

During the last 20 years there were number of significant changes in perception about the environment and the impact of human activity on it (Adams, 2003). However, the relationship a person has with his or her environment is a complex one that is influenced by a number of factors such as that person’s culture, religion and values. This will influence that person’s behaviour towards the environment including how that person views his or her role in that environment (Adams, 2003). Behaviour change is a complex process involving the interaction between numerous variables including perception specially attitudes. This Study was carried out to investigate the perception (current community knowledge, beliefs, attitudes and behaviour) in respect to home garden wildlife.

MATERIALS AND METHODS

The study was conducted by collecting primary and secondary data. Primary data were collected by a questionnaire and interviewing individuals from rural and urban areas in Kalutara and Badulla districts. Total size of the sample was 120. From the total sample 50% were urban dwellers and 50% were rural dwellers. An individual was considered as an experimental unit and they were selected randomly. A composite sample was obtained by collecting data from different locations of each district and people from different age groups. In the questionnaire the questions were prepared to understand the attitudes, behaviour and knowledge of people towards home garden wild life. Analysis of primary data was done by using the Statistical Package for Social Science (SPSS) (SPSS, Inc., 2007). Independent sample t-tests were done to compare rural and urban populations. The level of significance (alpha) was 0.05 (5%)
RESULTS AND DISCUSSION

The affection of people towards home garden wild animals was similar in rural and urban areas in Kalutara and Badulla districts (P=0.131). For the two categories of animals people showed positive feelings about large body sized animals. But they showed negative feelings on small body sized animals. Rural and urban people did not show any significant deference in knowledge about home garden wild animals (P=0.513). Behavioural component showed a significant deference between rural and urban people. (P=0.004). Both rural and urban people in Badulla district showed positive behaviour to encourage wild animals to their gardens. But in Kalutara district only the rural people showed positive behaviours to encourage wildlife to their gardens (table 1).

Table 1: Facilities provided to encourage wild animal presence

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Kalutara Rural</th>
<th>Kalutara Urban</th>
<th>Badulla Rural</th>
<th>Badulla Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water baths</td>
<td>12.0%</td>
<td>2.3%</td>
<td>36.0%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Ponds</td>
<td>6.4%</td>
<td>8.2%</td>
<td>2.6%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Flower gardens</td>
<td>64.3%</td>
<td>72.4%</td>
<td>73.3%</td>
<td>75.8%</td>
</tr>
<tr>
<td>Ropes</td>
<td>11.2%</td>
<td>7.9%</td>
<td>28.3%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Feeding trays</td>
<td>12.6%</td>
<td>6.3%</td>
<td>79.2%</td>
<td>77.5%</td>
</tr>
<tr>
<td>Housing</td>
<td>7.0%</td>
<td>6.2%</td>
<td>32.5%</td>
<td>28.0%</td>
</tr>
</tbody>
</table>

CONCLUSION

The results support the conclusion that people in general still have affection towards home garden wild animals. But only rural people behaved positively towards these animals.

REFERENCE

EVALUATION OF POTASSIUM SORBATE, \( \varepsilon \)-POLYLYSINE AND CHITOSAN FOR THEIR INHIBITORY ACTIVITY ON POST-ACIDIFICATION OF SET YOGHURT UNDER 20-DAY COLD STORAGE

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INTRODUCTION

Post-acidification in yoghurt can cause shortened shelf life, syneresis and defects in sensory quality of yoghurt and controlling the growth of lactic acid bacteria leads to reduce the level of post-acidification of set yoghurt. Potassium sorbate is commonly used to improve shelf life of fermented food items including yoghurt. However, the addition of natural preservatives to control post-acidification, such as chitosan and \( \varepsilon \)-polylysine is of interest because of their biocompatibility, nontoxicity, and antimicrobial action. Chitosan is made out of chitin and \( \varepsilon \)-poly-L-lysine is produced through natural fermentation of Streptomyces bacteria. This study was carried out to assess the effect of potassium sorbate, epsilon polylsine and chitosan for their inhibitory activity on post acidification of set yoghurt under cold storage.

MATERIALS AND METHODS

The yoghurts were prepared according to the method of Tamime and Robinson (2007) with slight modifications to its composition. Inoculation was done with 2% (v/v) freeze-dried direct-vat-set starter cultures containing *Lactobacillus bulgaricus* and *Streptococcus thermopilus* in 1:1 ratio. Three different concentrations (w/v) of chitosan (0.05%, 0.15% and 0.25%), \( \varepsilon \)-polylysine (0.005%, 0.015% and 0.025%) and potassium sorbate (0.05%, 0.075% and 0.1%) were added into inoculated yoghurt mixture separately. Three replicate trials were conducted for each treatment. Yoghurt samples were stored for 0, 5, 10, 15 and 20 days at 4°C for determination of titratable acidity and firmness. E-coli count and yeast & mould count were done at 1\(^{st}\), 7\(^{th}\) and 14\(^{th}\) days of cold storage. Sensory properties including colour, taste, mouth feel and overall acceptability were
evaluated on the 14th day of storage. Data were analyzed using one way ANOVA and Friedman non parametric test.

RESULTS AND DISCUSSION

Incorporation of potassium sorbate, chitosan and ε-polylysine reduced the acidity development of set yoghurt during cold storage than in control yoghurt (<0.05). 0.1% of potassium sorbate, 0.25% of chitosan and 0.005% of ε-polylysine were the concentrations (w/v) which optimally controlled the acidity development over the storage period of 20 days at 4°C. Firmness of yoghurts incorporated with preservatives were not different from that of control yoghurt (>0.05). chitosan totally inhibited the yeast and moulds growth during while other treatments did not.

Figure 1: Variation of titratable acidity of set yoghurt with optimum concentrations of the three preservatives at 4°C storage

As shown in Figure 1, from 11th day onwards the acidity of yoghurt added with potassium sorbate was lower than others while incorporation of ε-polylysine gave highest overall acceptability than others.

CONCLUSIONS

Incorporation of chitosan, ε-polylysine and potassium sorbate for yoghurts significantly decreased the acidity development of set yoghurts during refrigerated storage at 4°C. Low concentration (w/v) such as 0.005% of ε- polylysine was enough for controlling post-acidification when compared to commercially available potassium sorbate % and chitosan%.

REFERENCE

PERFORMANCE OF DIFFERENT TYPES OF VILLAGE CHICKEN IN KALMUNAI AREA.

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INTRODUCTION

Chicken meat and eggs have now become less expensive source of animal protein in Sri Lankan diet. Indigenous chicken production can be considered as a promising enterprise, especially under rural context. Owing to its low cost, such production systems are run by rural households utilizing their local knowledge of breeding, feeding and health practice (Abdelqader et al., 2007). To date, indigenous chicken production system is not given a proper attention in order to achieve the potential benefits of this low input sustainable system in Sri Lanka. Therefore, this study was carried out to investigate the performance of different types of village chicken management system in Kalmunai area.

MATERIALS AND METHODS

Seventy farm families were selected from seven villages come under Kalmunai municipal council for the investigation. The four types of village chicken identified in the preliminary investigations; namely normal village chicken (1), naked neck (2), frizzle (3) and long leg (4) were evaluated for egg production per hen per week, age at 1st laying (month), number of eggs per clutch, duration of clutch (day) and hatchability (%) and the egg quality parameters. Data were analyzed by using Minitab software package version 14.

RESULTS AND DISCUSSION

The village chicken farming system was a simple operation with chicken flock averaging 23±19.6 chicken per household. Majority (77%) farmers kept their village chicken under semi-intensive system. Egg production of all types was similar (p>0.05), ranging from 3.8 - 4.68 eggs/hen/week (Table 1). There were no significant differences (p>0.05) found in age at first laying and hatchability among the four types, though highest hatchability was recorded in
naked neck. Abdelqader et al. (2007) also reported the similar observations for village chicken in Jordan. Eggs per clutch and duration of clutch were significantly higher (p<0.05) in naked neck and long leg types, respectively.

Table 1. The performances of four village chicken types found in the Kalmunai area.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Eggs/hen per week</td>
<td>03.80a</td>
</tr>
<tr>
<td>Age at 1st laying(month)</td>
<td>06.30a</td>
</tr>
<tr>
<td>Eggs /clutch</td>
<td>18.4ab</td>
</tr>
<tr>
<td>Duration of clutch (day)</td>
<td>35.07ab</td>
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<tr>
<td>Hatchability (%)</td>
<td>78.00a</td>
</tr>
</tbody>
</table>

Means with the same latter within a row are not significantly different at p<0.05.

All egg quality parameters were not significant different (p>0.05) among four whereas nutrient quality parameters were not significant (P>0.05) among the types except for protein and fat.

CONCLUSION

Four village chicken types found in the area perform similar in production though naked neck and long leg chicken types perform better in overall. Egg quality parameters also found similar among four village chicken types except for protein and fat content.

REFERENCE

BEST SALINITY AND STOCKING DENSITY COMBINATION FOR ACHIEVING HIGHER GROWTH PERFORMANCE OF Penaeus monodon UNDER THE PRESENT CLIMATIC CONDITION OF PUTTALAM DISTRICT

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INTRODUCTION

Shrimp farming has great potential to diversify and secure income in rural Sri Lanka. Due to faster growth, large size attained and export potential, the black tiger prawn, Penaeus monodon has been selected for the brackish water shrimp culture in shrimp farming areas of Sri Lanka (Jayasinghe, 1995). However at present production performance of Penaeus monodon in Sri Lanka highly affected by poor water quality and poor management practices. It results low productivity and low economic profitability. Salinity in the major sources of water is an important factor for the shrimp farming. The high evaporation rates and relatively low rainfall in dry and arid zones result in unfavorable salinity ranges (50–65 ppt) during dry weather periods of the year. Some farms tap into groundwater resources to dilute high salinity water in to low salinity water, which is not an environmentally sound practice. Another critical factor that affecting shrimp growth is stocking density. The optimum stocking density of seeds in a pond determined in accordance with the production capacity of the pond and the culture system. Hence present study aimed to suggest most suitable salinity and stocking density combination which is more or less match with present environmental condition to achieve higher growth performance.

MATERIALS AND METHODS

The study was under taken in private shrimp farms selected from the Chilaw, Koththanthiv, and Palavi areas under three different salinity ranges and two different stocking densities. Always each salinity range includes two farms from both stocking densities. Samplings were taken from three ponds from each farm. Culture system in all experimented farms was semi-intensive. Cultured species was
Penaeus monodon. Water samples were analyzed every week and Penaeus monodon body weight also was measured at by weekly intervals from each selected pond. Collected data were analyzed using SAS software package (CRD model) and simple correlations were carried out using MS Excel Statistical package.

RESULTS AND DISCUSSION

In this present study, in high salinity farms salinity was ranging 39 to 52, in low salinity farms it was 19 to 24 and in medium salinity farms it was 26 to 31. There was a significant difference (P<0.05) in farms between main three salinity ranges. Over the experimental period mean pH value was ranged from 8.52 to 8.56. There was not a significant difference in pH (P>0.05) between farms selected from three different salinity ranges over the cultivation period. Average alkalinity was ranging between 80-90 in every farms and also there was no significant difference (P>0.05) in mean alkalinity values between three salinity range farms. Growth rate of P. monodon significantly difference (P<0.05) among the main three salinity ranges. Furthermore, Growth rate of P. monodon significantly difference (P<0.05) among two stocking densities. Under the each salinity ranges there were six ponds including three high density ponds and three low density ponds. According to the present study in high salinity farms there was no significant difference (P>0.05) in growth rates between high density and low density ponds. However in the medium salinity and low salinity farms there were significant difference (P<0.05) in growth rates between high density and low density ponds.

CONCLUSION

According to the present study, best salinity and stocking density combination for the shrimp farming in puttalam district is 24-32 ppt and 13-15 PL/m², respectively.

REFERENCE

DEVELOPMENT OF A LACTO-VEGETARIAN YOGHURT BY INCORPORATING “KITUL” (Caryota urens) PITH FLOUR STABILIZER AS A GELATIN SUBSTITUTE

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INTRODUCTION

Present food habits of people are changing throughout the world and a new concept called “Lacto-Vegetarianism” has emerged. Lacto-Vegetarianism encompasses the practice of following plant-based diets with the inclusion of dairy products, and exclusion of fish, meat and eggs. Conventional stabilizers like gelatin are not allowed to be used in Lacto-Vegetarian diets and accordingly food processors are investigating on potential plant origin stabilizers, in order to meet the market demands. Therefore, this research work was carried out to develop a Lacto-Vegetarian yoghurt by incorporating “Kitul” (Caryota urens) pith flour (KPF) as a gelatin substitute.

MATERIALS AND METHODS

Yoghurt samples were prepared according to the general procedure described by Tamime and Robinson (2007) with a change in the stabilizer. KPF and gelatin were compared with a control without a stabilizer. First experiment was carried out to observe the suitability of KPF as a stabilizer in yoghurt production followed by a sensory evaluation. The second experiment was carried out to determine the best incorporation level of KPF. Yoghurt samples were stored at 4 ± 1ºC for cold storage studies. Those three types of yoghurts; control yoghurt without stabilizer, 0.6%(w/v) gelatin added yoghurt and 1.8% (w/v) KPF added yoghurts were used to evaluate titratable acidity, pH, syneresis, texture, yeast & mould count and coliform count on every 3rd day during 12 days of storage period. The best product was subjected to proximate analysis. The data were analyzed using ANOVA and Freidman non-parametric test.
RESULTS AND DISCUSSION

Gelatin stabilized set-yoghurt was rated best, followed by KPF stabilized set-yoghurt during the sensory evaluation of first experiment. The lowest rank for all sensory attributes was observed in control yoghurt indicating that the absence of stabilizing effect has caused this difference. In the sensory evaluation of second experiment, the highest median score for overall acceptability was given to 1.8% (w/v) KPF added yoghurts illustrating that KPF has a beneficial contribution. The data concluded that the pH values of tested yoghurt showed significant difference (p<0.05) and it decreased with the increment of storage period in all yoghurt samples. On the other hand, titratable acidity values of tested yoghurts showed significant difference (p<0.05) and increased with the increasing storage period of all yoghurt treatments. It was observed that both KPF and gelatin tend to reduce syneresis when compared with control. Microbiological results revealed that the 1.8% (w/v) KPF incorporated yoghurts were safe for consumption for 12 days.

CONCLUSION

The results of this study showed that most of the characteristics of developed Lacto-Vegetarian yogurt, formulated only with KPF, were similar to that of gelatin-stabilized yoghurt. Therefore, KPF can be used as an alternative in the manufacture of Lacto-Vegetarian yoghurt. Moreover, addition of 1.8% (w/v) KPF had the highest overall sensory rating. It can suggest that cold storage studies could be carried out to determine the shelf life for further improvement of the developed product.

REFERENCE

COWPEA (*Vigna unguiculata* L. Walp) INCORPORATED EXPERIMENTAL DIETS MODULATE THE SERUM LIPID PROFILE AND CEACAL MICROFLORA IN WISTAR RATS (*Rattus norvegicus*)

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INTRODUCTION

Cowpea (*Vigna unguiculata* L. Walp) is a major grain legume in Sri Lanka. Whole cowpea seeds provide proteins, important vitamins, dietary fiber, phyto-nutrients including antioxidants besides carbohydrates, minerals and trace elements (Moses, 2006). In recent years, much attention has been paid to dietary interventions that lower plasma cholesterol concentration among humans as a tool to prevent and treat coronary heart diseases (Frota *et al*., 2008). This research study was carried out to investigate the effects of four different cowpea cultivars on the serum lipids and caecum bacterial population of Wistar rats fed with high fat diets.

MATERIALS AND METHODS

Seven weeks old 36 male Wistar rats were randomly divided into 6 groups with 6 replicates. They were housed individually in metal cages. After 7 days of acclimatization period, experimental diets were offered *ad libitum*. Experimental diets were prepared according to the AIN-93G semi-purified rodent diet (Reeves *et al*., 1991) and 23% lard was added to obtain the HFD (High fat diet). Treatments were; HFD with 20% whey powder (CNF), HFD with 20% Waruni cowpea powder (WAF), HFD with 20% Bombay cowpea powder (BBF), HFD with 20% Dawala cowpea powder (DAF), HFD with 20% MI35 cowpea powder (MIF) and NFD (non fat diet) with 20% whey powder (CNN). Body weight and food consumption were recorded weekly. Individual fecal matter was collected and weighed during the last 3 days of the experimental period. All rats were sacrificed after 6 weeks and blood was quickly collected under anesthesia. Liver, caecum, kidney fat and abdominal fat were dissected and weighed.
Lactobacilli, total anaerobes and Coliforms bacteria in caecal content were enumerated. Serum lipid profile was analyzed using assay kits for TDX system and liver antioxidant capacity was measured (AOAC, 2005). Data were analyzed by one-way ANOVA and means were separated by the Duncan’s multiple range test.

RESULTS AND DISCUSSION

Figure 1: Serum lipids and caecal bacterial population in rats fed experimental diets for 6 weeks

Serum Total cholesterol (TC), Non HDL cholesterol (LDL-C) and Triglyceride (TG) concentrations were lower \((P<0.05)\) in rats fed with the BBF and MIF diets compared that of the CNF. Significantly higher \((P < 0.05)\) Lactobacilli population was found in rats fed with DAF and MIF diets compared to CNF.

CONCLUSION

Cowpea incorporated experimental diets modulated the serum lipid metabolism and caecal fermentation in Wistar rats.

REFERENCES


DEVELOPMENT OF A LOW COST BLACK PEPPER FLAVORED PROCESSED CHEESE SPREAD WITH IMPROVED SENSORY QUALITIES AND LONGER SHELF LIFE TO THE LOCAL MARKET

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INTRODUCTION

Processed cheese spread is a product obtained by heating cheese with permitted emulsifier and/or stabilizer with or without buffering agent (SLS 773:1987). Processed cheese spread contains higher amount of moisture than natural cheese and other cheese products. This feature induces the growth of microorganisms which are mostly associated with food spoilage. Incorporation of black pepper as a spice to cheese spread is important to contribute a distinct taste for consumers and it provides health benefits to them. However, the most of the cheese spreads have poor sensory qualities and short period of shelf life. Yet their cost is very high. This study was carried out to produce a low cost pepper flavored processed cheese spread with higher sensory qualities and longer shelf life to the local market.

MATERIALS AND METHODS

Five different treatments of processed cheese spread were prepared by changing the level of black pepper. Black pepper powder was added at 0%, 0.5%, 1%, 1.5% and 2% (W/W) for treatment 1, 2, 3, 4 and 5 respectively. Prepared processed cheese spread samples were filled in to 80ml plastic cups and stored at both room temperature and refrigerated temperature (4⁻5°C) for sensory, chemical and microbiological analysis. Quality attributes such as flavor, color, spreadability, appearance and overall acceptability were analyzed using 30 untrained panellists. Data were analyzed using Friedman non-parametric test. The selected treatment was compared with a spice (onion) incorporated processed cheese spread available in the local market through a hedonic test. As chemical parameters pH, Titratrable Acidity and moisture content, and as microbiological parameters total plate count, yeast & mold count and coliform count
were measured periodically up to 6 weeks to evaluate the shelf life of the product. Cost analysis was done for the selected treatment to determine the easiness of market penetration.

RESULTS AND DISCUSSION

According to the sensory analysis the treatment 4 which contains 1.5% black pepper was selected as the best treatment due to the observable lowest hedonic median for many quality characters. Also there were no significant difference (p value > 0.05) observed in all the quality attributes except for flavor between the selected treatment and product available in the local market. Only the flavor of the new product is significantly different (p value < 0.05) from the market product which included onions as a spice additive. All the chemical and microbiological parameters were within the range of Sri Lankan Standards. Therefore, the product could be kept up to one and half month shelf life without any significant quality defects. The cost of production for the new product is Rs.950 per 1Kg which is much lower than the cost of product in the market (Rs.1500/Kg).

CONCLUSIONS

When compared to the similar product available in the market, the newly developed cheese spread has comparable higher sensory qualities, longer shelf life and additionally a low cost of production. In addition, incorporated black pepper provides taste variation as well as health attributes to the consumers.

REFERENCES

DEVELOPMENT OF A GARLIC AND CHILLI INCORPORATED CONCENTRATED YOGHURT

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INTRODUCTION

Process of making concentrated yoghurt is one of the oldest methods used to extend the shelf-life of milk. The medicinal and nutritional properties of various fermented dairy products have been experienced in different nations. Further improvement of these value added dairy products can be done by addition of certain functional ingredients that can increase the consumer acceptability and provide health benefits to the consumer. Spices such as garlic (Allium sativum) and chilli (Capsicum annuum) are used all over the world because of their ability in prevention and control of a variety of diseases. This study was carried out to develop a garlic and chilli incorporated concentrated yoghurt and to evaluate its consumer acceptability.

MATERIALS AND METHODS

The concentrated yoghurts were prepared according to the method described by (Misirlilar et al, 2012). Garlic paste was prepared by crushing fresh bulbs of garlic using house hold electric blender. Three levels of garlic, two levels of dried chilli powder and salt were mixed according to the ratios that were identified by the preliminary studies. Six treatment combinations were prepared as follows. T1= 2.5G, 0.5C, 0.75S, 96.25%Y, T2= 5.0G, 0.5C, 0.75S, 93.75%Y, T3= 7.5G, 0.5C, 0.75S, 91.25%Y, T4= 2.5G, 1.0C, 0.75S, 95.75%Y, T5= 5.0G, 1.0C, 0.75S, 93.25%Y, T6= 7.5G, 1.0C, 0.75S, 90.75%Y, where G=Garlic, C=Chilli, S=Salt, Y=Yoghurt.

All treatments and control sample were stored under refrigerated conditions (<4 °C) over period of 4 weeks and keeping quality parameters such as pH, titratable acidity and syneresis were measured every 4 days interval.
RESULTS AND DISCUSSION

Development of concentrated yoghurt using fresh raw standardized milk (<3.5% fat) could be another value added product for Sri Lankan dairy products. This concentrated yoghurt was formulated using internationally accepted mesophilic bacterial cultures (ABY3) which were proven to be having beneficial health effects. As shown in experimental data the product can be stored under refrigerated conditions up to two weeks. The product could be further improved in term of consumer acceptability and keeping quality by adding garlic paste, chilli powder and salt at different ratios as described above. According to the data on sensory evaluation, most acceptable treatment was T4 (T4= 2.5% garlic, 1.0% Chilli, 0.75% Salt and 95.75% Yoghurt) which scored significantly highest value for color and appearance and overall acceptability. The treatment T4 could be the best concentrated yoghurt with added garlic, chilli powder and salt.

CONCLUSION

Concentrated yoghurt can be introduced as another fermented dairy product which can be used as a dessert or bread spread among Sri Lankan consumers. This product could be further improved by adding garlic, chilli and salt, which increase the keeping quality and health benefit to the consumers.

REFERENCE

EFFECT OF WATER QUALITY ON THE GROWTH RATE OF *Penaeus monodon* (BLACK TIGER SHRIMP) CULTURED UNDER SEMI INTENSIVE SYSTEM IN PUTTALAM DISTRICT

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INTRODUCTION

Shrimp is the most popular sea food product in the international market with an excellent potential as an export commodity. The shrimp industry in Sri Lanka has become a promising foreign exchange earner to the country. Shrimp farming is done using several brackish water resources found along the North Western Costal Belt in Sri Lanka. However, variation in water quality is one of the main problems faced by the shrimp farming community in this area. It is well known that the growth rate of *P.monodon* is directly affected by the water quality parameters; nevertheless, the water quality influences the length of a culture cycle, causing a great influence on economic benefits. Therefore the present study is carried out to evaluate the Growth rate of *P. monodon* in Kalpitiya, Chilaw and Puttalam area in relation to different water quality parameters (pH, Total Alkalinity, and Salinity).

MATERIALS AND METHODS

For the experiment, *Peanaus monodon* (Black tiger shrimp) was selected. According to the crop calendar of North Western Province (NWP), three zones (Puttalam, Chilaw and Kalpitiya) were selected from Puttalam district. From the each zone, three farms were selected randomly. Three ponds are the replicates for each Farm. Replicated water samples were collected every week directly from the ponds in order to determine the pH, Total Alkalinity and salinity and also Total body weight were measured weekly. The Experimental design was NESTED Latin Square Design (LSD). Differences of the means of weekly pH, salinity, Total Alkalinity, and growth rate of shrimp among the three zones were analyzed using a Least Significant difference test for mean separation. Data were statistically analyzed using SAS 9.1.3 Statistical Package (SAS Ins.).
RESULTS AND DISCUSSION

In semi-intensive shrimp culture, the accepted pH, Salinity and Total Alkalinity values should be maintained between 8 - 8.5, 10 -26ppt and 100 -150ppm respectively. pH, salinity and Total Alkalinity values of cultured water in Chilaw was fluctuated within a optimum range. In Puttalam and Kalpitiya, fluctuated above the optimum range. The growth rate of shrimp in Chilaw was significantly higher (P<0.05) than Puttalam and Kalpitiya zones.

Table 1. Water quality parameters variations in three zones

<table>
<thead>
<tr>
<th>Zone</th>
<th>pH</th>
<th>Salinity(ppt)</th>
<th>Total Alkalinity (ppm)</th>
<th>Mean Body weight of Shrimp (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ± SD</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Puttalam</td>
<td>8.70a ± 0.18</td>
<td>29.04a ± 6.43</td>
<td>117.5a ± 12.42</td>
<td>15.87b ± 0.01</td>
</tr>
<tr>
<td>Chilaw</td>
<td>8.46c ± 0.41</td>
<td>23.33b ± 3.67</td>
<td>102.64b ± 21.10</td>
<td>18.66a ± 0.02</td>
</tr>
<tr>
<td>Kalpitiya</td>
<td>8.56b ± 0.33</td>
<td>28.41a ±4.90</td>
<td>98.33c ± 22.33</td>
<td>15.75b ±0.01</td>
</tr>
</tbody>
</table>

CONCLUSION

pH, salinity and Total Alkalinity of farms in Chilaw zone were fluctuated within optimum range. However farms in Puttalam and Kalpitiya zones, pH and salinity fluctuated above the optimum. Higher growth rate of shrimp was observed in Chilaw compared to Puttalam and Kalpitiya. The result indicates water quality parameters highly depend on the growth rate of Shrimp.

REFERENCE

MODELLING OF LACTATION CURVES AND PROGENY TESTING (FOR GROWTH TRAITS) OF DAIRY SIRES USED IN TALAWAKELE VETERINARY RANGE

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INTRODUCTION

Genetic improvement of local cattle is essential to achieve self-sufficiency in milk production. Estimation of genetic parameters of the population and progeny testing using the present AI sires are prerequisites for selection programs. Therefore, this study was carried out in 51 villages of Talawakele veterinary range in Nuwara Eliya district to: 1) investigate management conditions of small scale dairy farmers; 2) model lactation curves of dairy cattle at field level; 3) determine factors affecting growth of calves and; 4) to estimate genetic parameters and breeding values of AI sires, with respect to growth of calves.

MATERIALS AND METHODS

For the first objective, a survey was carried out to collect information on the management system of 200 farms. For the other 3 objectives, records maintained at the Talawakele veterinary office were used. Wood’s formula \( Y_t = a b^{ct} \); where \( Y_t \) is the daily yield at \( t \)th day in milk and \( a, b, \) and \( c \) are parameters, as in Wood (1967)] was fitted to a set of 12,668 morning and evening milk records of 40 cows using nonlinear regression procedure in SAS to model lactation curves. Weights of calves at birth (BWT) and, 3 (WT3) and 6 (WT6) months of age were considered as growth traits. Factors such as breed of calf, sex of calf, calving difficulty, parity of dam and birth month were tested for possible significant effects on the three growth traits using ANOVA procedure. The growth traits of a set of progeny from 14 random AI sires (9 Friesian and 5 Jersey) were used in half sib analysis to determine heritability and subsequently breeding values of the sires, following Falconer (1982).
RESULTS AND DISCUSSION

The survey showed that all farmers in Talawakele range have adopted intensive system with feeding of CO-3 grass and concentrates. Morning milk yield amounted to 60 per cent of the mean daily total of 11.0 litres per cow. Wood’s model was found to fit satisfactorily for daily yields as well as morning and evening yields. Friesian cows were clearly superior with a peak yield of about 15 litres compared to 14 litre peak of Jersey cattle. Means of BWT, WT3 and WT6 in the calves were 32.27 kg, 69.59 kg and 111.88 kg, respectively. Friesian sires and dams produced significantly heavier calves at 3 and 6 months than Jersey parents (P<0.05). Sex of calf and parity of dam had no influence on the growth traits of calves (P>0.05). Heritability estimates for BWT, WT3 and WT6 were 0.27, 0.81 and 0.64, respectively. The best sires for the growth traits were Friesians namely F-419 (for BWT and WT6) and F-436 (for WT3).

CONCLUSIONS

The present study shows that pure Friesian cows perform much better than pure Jersey and crossbred (Friesian*Jersey) cows in Talawakele range. Moderately high heritability values found for body weights of calves at 3 and 6 months of age indicate the presence of sufficient genetic variability for carrying out a genetic selection program using those traits to improve body weight of cattle. Friesian sires reported the highest breeding values for the growth traits measured. Differences in ranking among sires for the three growth traits suggest the need to carry out progeny testing procedure with a much larger data set including daughter cows from nearby ranges.

REFERENCE

DEVELOPMENT OF IMMUNITY ON KOI CARP, *Cyprinus carpio* (L.) BY USING MEDICINAL PLANT, *Solanum xanthocarpum*.

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INTRODUCTION

Fish culture is a main industry in Sri Lanka. Major constraint for fish culture is diseases. Many chemical compounds use, are not environment sound and cause drug resistance. Future trend for solve the problem is increase immunity of fish using immunostimulatory plant materials. ‘Katuwelbatu’ (*Solanum xanthocarpum*) is good immunostimulatory herb which can find in Sri Lanka. However, many studies have shown that the immunostimulants can increase immunity of fish against diseases. This study was carried out to assess the effect of immunity on koi carp by ‘Katuwelbatu’ against *Aeromonas hydrophila* which cause hemorrhagic septicaemia to fish.

MATERIALS AND METHODS

Koi were reared in 12 cylindrical tanks. Four types of feeds were produced. Feed 01 (5%), 02 (10%) and 03 (15%) were produced, adding *S. xanthocarpum* feed stuff and control was without it. First blood sampling was done after 38 days of feed trial. Bleeding was done at caudal vein of fish after anaesthetized by clove oil. Serum total protein and albumin was measured by known reagents (Biolabo-France). Globulin was taken by subtracting above two. Pure *Aeromonas* bacterial broth was developed and $5.4 \times 10^6$ CFU/ ml bacteria solution was made. Fish of each fed group were injected 20 µL of solution intraperitonially. Symptoms were detected. Again blood sampling was done 3 and 6 days after injection. Blood smears produced, stained. Lymphocytes were count. Death fish were dissected and calculated hepatosomatic index. Micro agglutination test was estimated by method described by Robertson (1990). Data was analysed (CRD) by SAS system LSD for mean difference.
RESULTS AND DISCUSSION

Serum protein levels were not shown significant difference (P>0.05). Lymphocytes were increased (P<0.05) (Figure 2) fed 01 and fed 02. HSI decreased (P<0.05) at all *S. xanthocarpum* fed groups and mortality rate was very low (Table 01). Antibody titre, high (P<0.05) in treated feeds and control. Feed 3> Feed 2> Feed 1> control (Antibodies),

CONCLUSION

*S. xanthocarpum* can be enhanced innate fish immunity system. It can be increased lymphocyte amount, antibody titre and decreased HSI. All 3 feeds can be used for fish culture. But plant cannot be enhanced serum protein level, globulin and albumin.

REFERENCE

A SURVEY ON NUTRITIONAL STATUS AND ANIMAL PRODUCT CONSUMPTION PATTERN OF ADOLESCENT SCHOOL CHILDREN IN TRINCOMALEE DISTRICT, SRI LANKA

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INTRODUCTION

Children aged between 11-18 years old, are called adolescent. During this stage of life where growth is accelerated and major physical and sexual development takes place. Anthropometric measurement is one of the direct assessment methods of nutritional deficiency. In adolescents with regard to malnutrition, insufficient daily intake of meat, fish, egg, and dairy products or long term starvation is positively associated with problems in their Intelligence Quotient (IQ), academic achievement and body growth. The aim of this was to investigate the animal product consumption pattern and the nutritional status of adolescent school children in Trincomalee district.

MATERIALS AND METHODS

The study group was composed of 600 adolescent school children in Trincomalee district. Adolescent’s socio economic background such as age, sex, religion, family size, nature of child, education of their parents, occupation of their parents, family income and animal product consumption pattern were analysed with a structured questionnaire. Anthropometric measurements of adolescents such as body mass index (BMI), mid upper arm circumference (MUAC) and skin fold thickness (SFT) were measured. Pearson correlation between variables of anthropometric measurements and significant relationship between dependent variables and frequency analysis were using SPSS and SAS software packages.

RESULTS AND DISCUSSION

In the study sample, 49.5% (N=297) were males and 50.5% (N=303) were females. As shown in Table 1, most of the
adolescents’ belong to under weight category according to their BMI.

**Table 1.** Classification of students according to their BMI

<table>
<thead>
<tr>
<th>BMI category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under weight (BMI&lt;18.50)</td>
<td>79.9%</td>
</tr>
<tr>
<td>Normal weight (BMI 18.50-24.99)</td>
<td>17.7%</td>
</tr>
<tr>
<td>Over weight (BMI&gt;=25)</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Majority of female students (59.9%) have attended menarche at an average age 12.86 years. 34%, 63%, 96% of the adolescents have never consumed fresh milk, beef and pork respectively.

![Figure 1](#)  
**Figure 1:** Relationship between BMI and MUAC  
![Figure 2](#)  
**Figure 2:** Relationship between SFT and MUAC

Only 39% of adolescents consumed chicken once a week. Significant positive correlations were found between BMI & MUAC ($r=0.78360$, $P < 0.05$) and SFT & MUAC ($r=0.57845$, $P < 0.05$). Furthermore, anthropometric measurements were significantly related to the puberty age of adolescent female, fathers’ alcohol consumption, family income and education of their mother.

**CONCLUSION**

In summary, majority of the adolescents in Trincomalee district suffer from under nutrition condition. Consumption pattern of animal food products is low among these adolescent students. It appears that there is need to develop sound food habits among school children that may help their overall growth and development.

**REFERENCE**

Dinaranga, H. A.  Amarasekara, P. N.  Darshika, S. S. A. N.  Epasinghe, T. M.


Kumara, D. M. C. R.  Manoshika, O. K. E.  Nanayakkara, D. T.  Pathirana, E. P.

Pireyangan, M.  Prasangi, M. D. K. A.  Rajapaksha, D. S. W.  Rodrigo, B. K. N. P.
Final year research projects conducted by Animal Science majoring students during the period of 2003-2011

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Contribution of indigenous animals in local beef industry and its influence on genetic improvement
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Formulation of low cost rations using non-conventional feed resources for growing rabbits
   A. Vinodahewa, S. Premarathna and I.K. Attapattu

Effect of transportation temperature, composition of medium and incubator condition on in-vitro maturation and fertilization of goat oocytes
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Evaluation of semen characteristics and fertility in nine ecotypes of indigenous chicken
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Changes of Vibrio counts in shrimp farming areas of Chilaw, Mundal and Puttalam lagoons during the Maha season

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   W.D.P.L. Warnakula and U. Edirisinghe

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   L.H.M.S. Bandara and M.N.M. Ibrahim

Evaluation of the present status of cattle and buffalo farming in Udawalawe/Ambilipitiya area
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An evaluation of two large-scale livestock farms
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Development of a low cost and sustainable poultry production system under coconut plantations  
_U.P.S.P. Wijayasinghe, M.N.M. Ibrahim and A. Samarajeewa_

Accelerated method of fermented Tuna sauce preparation  
_L.S. Senarathna and H.W. Cyril_

Effect of selected green herbals as non-conventional colouring and flavouring agents in low fat commuted meat products  
_J.A.S.P. Jayasinghe, H.W. Cyril and N. Edirisinghe_

Preparation of oyster sauce by using pineapple and papaya juice  
_D.M.M.K. Dissanayake, H.W. Cyril and M.S.P.D. Ranasinghe_

Efficiency of machinery and labour usage in meat processing  
_P.H. Ranaweera and H.W. Cyril_

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A study on livestock farming activities, botanical composition and forage quality in Handapan-villu grassland of flood plain national park  
_D.M.J.R. Dissanayake, V.P. Jayawardena and G.G.C. Premalal_

\textbf{Year 2004 A}

Vascular endothelial growth for system in the bovine oviductal contractions: A possible involvement in the embryo transport  
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Optimal hormonal regime and using phosphate buffered saline and undissociated cumulus oocyte complex, for embryo transfer in mice  
_R.D.C.S. Ranadheera and E.R.K. Perera_

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Effect of long-term application of animal manure on pollution in upcountry cultivated soil
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Yield and nutritive value of Napier hybrid (CO-3) and Guinea grass (VRI-435) as affected by fertilizers
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   *P.H.P. Prasanna and H.W. Cyril*

Preparation of marinated chicken products for barbecuing
   *D.M.D.D. Pethiyagoda and H.W. Cyril*

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   *T.K.C.K de Silva and H.W. Cyril*

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Development of HACCP for row frozen head on and headless shrimp products
   *M.P.S. Darshani and U. Edirisinghe*

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Mineral profiles of some water sources used for shrimp farming in the North-Western Province of Sri Lanka
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A Financial analysis of the Isurudisi Fisheries Cooperative Society account at Ibbankatuwa
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Evaluation of performance of exotic swine under tropical farm condition
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M.R.M. Farzan and C.M.B. Dematawewa

Case study of cattle farming system in Kahabiliyawa village of Mid-County Intermediate-Zone
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A.A.C.A. Amarasinghe, S. Premaratne and G.G.C. Premalal

Incorporation of mushroom in chicken sausage

J.M.G. Duminda, H.W. Cyril and N.P. Edirisinghe

Factors determining the consumer preference and purchase decision on chicken meat in Sri Lanka and Japan

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Study on post harvest quality losses of Thunnes spp. Handled export industry

R.D.K. Sumanasiri, H.W. Cyril and G.J. Ganegama Arachchi

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P.D.G.E. Perera, H.W. Cyril and N. Lalantha

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Present involvement of quarantine service for the ornamental fish export industry in Sri Lanka

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H.C.V. Hendawitharana, U. Edirisinghe and K. Senanayaka

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Phenotypic variation of village chicken in Sri Lanka; Development of interactive CD-ROM
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  *C.D. Kodituwakku and Udeni Edirisinghe*

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Development of ready to eat spicy chicken product
  
  *P.D.C. Dissanayaka and H.W. Cyril*

Development of chicken Ambuthial
  
  *L.H.A.C. Kumara, H.W. Cyril and N.P. Edirisinghe*
Proceedings of 22nd Annual Students Research Session, Department of Animal Science, 2012

Development of chicken based cholesterol reducing sausages
   K.V.I.J. Perera, H.W. Cyril

Development of chicken based spicy ham
   L.H.D. Ramanayaka, H.W. Cyril1 and Anton Kalubowila

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M.D.R. Jayasinghe and E.R.K. Perera

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M.K.S. Priyantha, K. Samarasinghe, J.K. Vidanarachchi and J. Goonaratne

Development of orange sausages for preschoolers

R. Janardhanan, H.W. Cyril and J.K. Vidanarachchi

Development of ready to cook spicy curry pork and pork Ambulthial

P.A.S.M. Seneviratne, H.W. Cyril, J.K. Vidanarachchi and N. Lalantha

Development of mechanically separated meat (MSM) for standard chicken sausage

S.A.M.A. Rajasooriya, H.W. Cyril, J. K. Vidanarachchi and Anton Kalubowila

Feasibility study on introducing chicken pieces as convenient chicken product
S.A.S.K. Subasinghe and H.W. Cyril

Year 2009

Development of ready to eat type barbeque products from chicken wings

Evaluation of factors affecting on water uptake of broilers under immersion chilling
N. Weerasinghe, J.K. Vidanarachchi, M. Imitiaz, N.D. Senevirathna and H.W. Cyril

Effect of slaughtering age, strain and sex of broiler birds on carcass quality characteristics

Development of chicken burgers with the incorporation of Kohila (Lasia spinosa) and Oyster mushroom (Plueratus ostreatus)

Labour efficiency and factors affect on the labour efficiency in a manually operated small scale poultry processing plant
S.R. Mohammed, J. K. Vidanarachchi and H.W. Cyril

Identification of the best method to apply liquid smoke to chicken sausage for an optimum development of colour
U.S. Perera, J. K. Vidanarachchi, Krishantha Wijesuriya and H.W. Cyril

Development of a garlic flavoured fish sausage using off cuts of yellow-fin Tuna (Thunnus albacares)

Effect of bio-mos® (mannanoligosaccharide) supplementation on performance, organ development and intestinal microflora of broiler chickens
J.A.D.S. Lakdeep, T.S. Samarakone, J.K. Vidanarachchi and S. Kariyawasam
Evaluation of sperm motility in deep frozen bull semen: effect on the success rate of artificial insemination in Sri Lanka
   R.P. Liyanage, S. Sivayoganadan, W.W. Abeygunawardene and M.P.B. Wijayagunawardene

Enhancing the survival of probiotic bacteria in bio-yoghurt during refrigerated storage by incorporation of arrow root (Maranta arundinacea)

Electrophoretic analysis of beta-casein A1 protein in milk derived from four dairy cattle breeds in Sri Lanka

Determination of optimum manufacturing conditions to minimize age thickening and sandiness defects of sweetened condensed milk

Development of a strawberry (Fragaria ananassa) incorporated frozen yoghurt
   S.M. Kaluarachchi and K.F.S.T. Silva

Development of a cream spread by incorporation of different spices and stabilizers
   H.F.P.N. Fonseka and K.F.S.T. Silva

Preparation of low cost culture media suitable for mass culture of Moina micrura at farm level
   H.W.N. Sewwandi, U. Edirisinghe and T.G. Wijewardana

Evaluation of socio-economic status and identification of present reservoir management strategies of fishing community around Katiyawa reservoir
   A.N.C. Mendis and U. Edirisinghe

Sex reversal of nile tilapia (Oreochromis niloticus) using hormonal immersion technique

Effect of increased protein level in supplementary diet on the length of post partum anoestrus in dairy cattle
   S.D.N. Madhusanka and E.R.K. Perera

Comparison of performance of broilers in different climatic zones under a buy-back system
   A.W.M. Fazil and C.M.B. Dematawewa
Genetic and farming system characteristics of Jaffna local sheep in Sri Lanka

E.A.N.D. Ranathunga and G.L.L.P. Silva

Year 2010

Determination of residual nitrite levels in processed meat products available in Sri Lanka


Effect of incorporation of lentils (Lens culinaris l.) as the binder on quality and composition of chicken sausages


Determination of optimum concentration of aluminum sulphate for the control of snail (Pomacea canaliculata) in aquatic plants

W.M.P. Aravinda, A.R.S.B. Athauda, U. Edirisinghe and M. Babaranda

Improvement of the sensory qualities and wholesomeness of lassi by incorporation of mango (Mangifera indica) pulp and toning with soy (Glycine max) milk

A.B.G.K. Baduge and K.F.S.T. Silva

Analysis of buffalo (Bubalus bubalis) production systems in hambantota area

S.C. Gamage and G.L.L.P. Silva

A comparison of growth rate of Penaeus monodon in relation to physico-chemical parameters in chilaw lagoon, puttalal lagoon and dutch canal areas


Modelling of lactation curves for yield prediction and management decision making for holstein fribians in upcountry Sri Lanka

G. D. C. Jayasuriya and C. M. B. Dematawewa

Estimation of fish waste landed by multiday boats at negambo

J.A.U.L. Jayawarna, A.N.F. Perera and D.S. Jayakody

Evaluation of dairy villages in Nuvaraeliya district

K.M.D.Y.K. Karunanayaka and E.R.K. Perera
Evaluation of antibiotic resistance of *Escherichia coli* and salmonella in broiler chicken in sri lanka


Analysis on total bacteria population including lipolytic, proteolytic and psychrotrophic bacteria at different links of the milk procument chain in Thamankaduwa area


An evaluation of overall contribution of the co-operative society for the socio-economic upliftment of fishing community at pesalai in Mannar island

*P.C.P. Luxsan, U. Edirisinghe and A.R.S.B. Athauda*

Preparation of lingus: the best formula and keeping quality

*J.S. Manathunga, C.M.B. Dematawewa, K. Wijesooriya and H.W. Cyril*

Prediction of live weight based on morphometric measurements of Friesians and Ayrshires under semi intensive conditions in up country, Sri Lanka

*H. D. A. T. Nirmal and C. M. B. Dematawewa*

Effect of organic trace minerals and vitamin e on performance and mineral balance of broilers

*T.P.M.R. Premadasa, J.K. Vidanarachchi, S. Kariyawasam and K. Samarasinghe*

Metabolic status and reproductive performance of transition dairy cows at Ambewela dairy farm

*S. Ramachandra, M. P. B. Wijayagunawardena, V.P. Jayawardena and M. B. P. K. Mahipala*

Estimation of sausage production-line efficiencies and financial analysis of ‘d & w food products (Pvt) limited’, Makandura

*R. M. P. D. Rathnayake, B.C. Jayawardana, D.G.C. Prasanna and H.W. Cyril*

Evaluation of antibiotic resistivity in *Escherichia coli* and salmonella isolated from broiler chicken meat available in Sri Lanka


Evaluation of a commercially available herbal preparation as a growth promoting feed additive for broilers
K.H.M. Sanjaya, J.K. Vidanarachchi, A. Gunasekara and K. Samarasinghe

Use of lentils (Lens culinaris L.) As an ingredient in ready to eat ovo-vege fingers

Use of lycopene as a natural colorant for development of a pork sausage
N.H. Thilakarathna, J. K. Vidanarachchi, B. C. Jayawardana and D. C. K. Illeperuma

Assessment of pain induced by castration in 14 and 28 day old piglets: vocalization and subsequent growth and behavioural responses
M.M.U.P. Weeratunga, M.B.P. Mahipala, K.S.P. Amaratunga and T.S. Samarakone

Study of heavy metal contamination in sword fish (Xiphias gladius) and marlin fish (Makaira indika) export from Sri Lanka

Changes in postmortum quality & shelflife determination of frigate mackerel (Auxis thazard) and ray (Dasyatis margarita) during ice storage
W.M.N.M. Wijesundara, J.K. Vidanarachchi, B.C. Jayawardana and C.M.B. Dematawewa

Analysis of spore forming bacteria in raw milk targeted for manufacturing of Ultra High Temperature (UHT) treated milk in Polonnaruwa area
M.A.A. Pubudu Kumari, J.K. Vidanarachchi and K.F.S.T. Silva

Development of fruit yoghurt by incorporating preserved strawberry grown in Sri Lanka

Formulation and development of a low cost pet food by using fish processing waste

Effect of different cooking methods on the quality of the boneless chicken drumsticks
K.G.S.W. Gnanathilaka, J. K. Vidanarachchi, B. C. Jayawardana, A. A. Nirosh Lalantha and H. W. Cyril
Effect of pre and post slaughter factors on physical quality of commercially produced broiler chicken carcasses

W.H.R.E. Fernando, B.C. Jayawardana, M. Imtiaz and H.W. Cyril

Constraints encountered in promoting medium scale dairy operations & estimation of cost of milk production in central province

S. H. Yapa and K. F. S. T. Silva

Perception of consumers and broiler chicken producers on animal welfare and present welfare status in broiler chicken farms in Kandy district

K. M. S. Indunil, T.S. Samarakone and M.B.P. Kumara Mahipala

The effect of delaying time on histamine formation and activity of fish spoilage bacteria in the muscle of yellow fin tuna (Thunnus albacares) and skipjack tuna (Katsuwonus pelamis)

K. N. B. Rathnayaka, J. K. Vidanarachchi, L. G. S. J. Alexander and A. Dissanayaka

Year 2011

Developing a practical and reliable protocol to assess the internal parasites of asian elephants, and its application to a comparative study of captive, semi captive and wild elephants in selected localities

K.S. Abeysinghe, A. N. F. Perera, and Prithviraj Fernando

Evaluation of hydroponically grown maize fodder for dairy production in Sri Lanka

W.K.N.J. Amarasinghe, V.P. Jayawardan, G.C.C. Premalal and S. Hettiarchchi

Effect of different concentration of 17α-methyl testosterone & temperature on sex inversion of Nile tilapia (Oreochromis niloticus) under immersion technique

P.K.S. Chameera and A.R.S.B. Athauda

Antioxidant effect of onion (Allium cepa) on lipid oxidation and sensory quality of cooked pork sausages

S.D.P.M.P. Chandika, B.C. Jayawardana, J.K. Vidanarachchi, and R. Liyanage
Antioxidant activities of black and green tea extracts in uncured pork sausages.
V.A.K.I. Dharmasena, B.C. Jayawardana, M.B.P. Mahipala and G.H. Thotawattage

Development of lentil incorporated shrimp sauce

Positive effect of lentils (Lens culinaris l.) and cassava (Manihot esculenta c.) leaves incorporation into meat systems on the iron bioavailability of blood profile of guinea pigs (Cavia porcellus)
G.K.I.N. Galgamuwa, J.K. Vidanarachchi, M.Kurukulasooriya, P. Thavaraja and D. Thavarajah

Incorporation of Canadian Lentil (Lens culinaris L.) AS THE BINDER, improves the nutritional composition and sensory quality characters of chicken burger
G.I. Godahewa, J.K. Vidanarachchi, B.C.Jayawardana, P. Thavarajah and D. Thavarajah

Species composition and dung beetle guilds in buffalo dung in four agroclmatic regions
R.N. Jayadheera, A.N.F. Perera and J.P. Edirisinghe

Potential of producing milk at a lower cost using a newly formulated “concentrte feed mixture”

Comparision of vibrio counts in probiotic farming of black tiger shrimp, (Penaeus monodon) in chilaw area
D.G.A. Kumara, U. Edirisinghe and Chaminda Fernando

Development of mechanically deboned meat incorporated chicken sandwich spread
I.A. Ranaweera, B. C. Jayawardana, J.K. Vidanarachchi and N. C. Sooriyarachchi

Angiotensin-I converting enzyme (ace) inhibitory activity of the milk fermented with Lactococcus lactis subsp. lactis nbrc 12007 and Saccharomyces cerevisiae k7

Association between egg production and body morphology of some village chicken eco type in Sri Lanka
M.N. Sanjeewa  J.K. Vidanarachchi and G.L.L.P. Silva

Development of suitable inoculation procedure for the preparation of silage from hybrid sorghum

J.K.J. Thamali, V.P. Jayawardana and G.C.C. Premalal

Development of ready-to-eat snack food by using canadian lentil (Lens culinaris l.) flour and chicken gizzard

B.V. Bulathsinghala, H.W. Cyril, P. Thavarajah, and D. Thavarajah

Heritability estimation for birth weight and modeling of growth of goats in the state farms in Sri Lanka

M. Arunshankar and C.M.B. Dematawewa

Evaluation of the effect of different freeze-dried direct-vat- set commercial starter cultures on sensory qualities and shelf life of set yoghurt


Economic analysis of buy-back system of poultry: a case study

J. Sajahan and C. M. B. Dematawewa

Evaluation of growth yield nutrient composition of multi-cut hybrid fodder sorghum millet varieties in Sri Lanka


Development of an improved version of curd with short setting time and based on cow & buffalo milk mixture using a freeze dried direct- vat- set starter culture


Comparison of composition, shelf life and sensory qualities of khoa based traditional Indian sweetmeats: gulabjamun, burfi and kalakand

K.S. Amali, K. Jayarathna and K.F.S.T. Silva

Incorporation of plant based gelling agents as the stabiliser to replace gelatin in set-yoghurt.


A preliminary evaluation of socio-economic status of inland fisheries societies in Batticaloa district

T. Niroshantha and Udeni Edirisinge
A comparison of growth rate of *Penaeus monodon* with and without probiotics under semi-intensive farming system in Puttalam district, Sri Lanka

*T. Niloshan, U. Edirisinghe and C. Fernando*

Determination of optimum time-temperature combination for HTST pasteurization to extend the shelf life of liquid milk obtained from Kandy district of mid-country region in Sri Lanka

*J. Vidianapathirana, R.M.C. Deshapriya and K.F.S.T. Silva*

Development of a low cost yoghurt based weaning food for 1-3 years old toddlers by incorporation of mungbean (*Vigna radiata*), soybean (*Glycine max*) and brown rice (*Oryza sativa*) for the Sri Lankan market


Determination of the suitable place for sea cucumber farming in Jaffna peninsula

*N. Haran, A.R.S.B. Athauda and Upali Mallikarachchi*

Development of liver mush prepared with pork “variety meat”

*K.A.S.L Kumarapeli, H.W. Cyril, A. Kalubowila and N. Lalantha*
The Global Environment Facility (GEF), the world’s largest public funder of international environmental projects, is supporting the Development and Application of Decision-support tools to conserve and sustainably use genetic diversity in indigenous livestock and wild relatives project initiative led by Bangladesh, Pakistan, Sri Lanka, Vietnam. International Livestock Research Institute (ILRI) is coordinating the project with implementation support from the United Nations Environment Programme (UNEP). Working
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