



TANUVAS TECHNICAL REPORTER

*An official publication of research and developmental activities of
Tamil Nadu Veterinary and Animal Sciences University*

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NANDANAM BROILER 3

Poultry Research Station (PRS) established at Nandanam in the year 1941 and presently located at Madhavaram Milk Colony, Chennai during 2011 functions with the mandate to serve as avian species instructional farm for the under - graduate and post - graduate students and supply of superior germplasm of chicken (broilers, layers, fancy birds), Japanese quails, turkeys, guinea fowls and geese to the farming community. This research station is also concentrating on evolving elite germplasms through advanced scientific breeding technology in chicken, Japanese quail, turkey and guinea fowl. Recently (2017-18), Poultry Research Station released a multi coloured chicken (broiler strain) named Nandanam Broiler 3 so as to improve the productivity of the small scale broiler production.

Preamble

The commercial broilers with white feather became prey for predators while being reared in the backyard system of rearing. Demand mainly exists for coloured plumage and brown shelled eggs in the rural community. A synthetic multi plumage coloured broiler strain (Nandanam Broiler 2; B2) which was developed for meat purpose by TANUVAS during 1997 started exhibiting comparatively low performance traits in terms of body weight, feed conversion efficiency and fitness characters due to high level of inbreeding over the generations. Also, high proportion of birds with black plumage in Nandanam

Broiler 2 appeared in subsequent year. By considering these factors, the new strain (Nandanam Broiler 3; B3) was developed by crossing two strains such as VenCobb male with Nandanam Broiler 2 female. These two strains were crossed through artificial insemination and the resultant population was pooled for the development of synthetic strain through sustained selection and breeding for seven generations.

It is new well-suited for backyard poultry farming with better feed conversion ratio and tenderness of the meat. The meat has primed in all sensory attributes especially taste and the unique flavor of the meat is relished by most of the consumers. So, the developed strain will be complemented with the positive characters from both the strains such as

- ▲ multi-coloured feather pattern
- ▲ brown shelled eggs
- ▲ meat primed with all sensory attributes
- ▲ better body weight and improved feed conversion efficiency
- ▲ good survivability under the backyard system

This new germplasm (B3) is handy for the micro-economic, small and medium scale entrepreneurs and the resource poor rural women. There is no need of adopting stipulated and well-defined feeding strategies for this strain which is being followed in commercial broiler rearing. The birds will perform well even with a hand full of feed raw ingredients including azolla. The

chicks need to be kept under brooding in the intensive system of management at least for a period of two weeks before being sent to the backyard rearing. This strain can be further propagated in the farmers field itself by growing the same as parents. This cannot be practiced while getting the commercial broiler strain available from the breeding companies. This strain (B3) is commonly utilized in the religious functions and festival occasions.



Objective and breeding programme adopted to develop the strain

Nandanam Broiler 2 female and VenCobb (Broiler Breeder) male were used as the base population. Initially, for a period of two generation, random breeding was carried out in the existing parent flock of two strains. Within family selection was carried out based on the phenotypic performance of the F1 offspring after eliminating the individuals with white plumage. *Inter se* flock mating was followed in the selected population to produce F2 generation. From the third generation, 24 number of breeding pens were formed with 24 males and 144 females with a sex ratio of 1:6. There after within family selection was continued to select the offspring to act as a parent for the next generation. Totally, 1600 day old straight run broiler chicks, approximately 70 chicks from a family (in 5 hatches), were taken as the replacement population in each and every generation. Eighth week body weight was fixed as the selection criterion and the selection pressure was maintained at 1 in 6 for females and 1 in 33 for males so as to achieve eighth week body weight of 1.30 kg with feed conversion efficiency at 2.50 and livability of 95 per cent.

Salient Features of Nandanam B3

- ▲ A multi-coloured broiler strain.

- ▲ Good disease resistance, adaptability to substandard managerial conditions and massive appearance of adult are special features.
- ▲ Body weight of 1.30 kg at 8th week with feed efficiency of 2.50 and livability of 95%.
- ▲ More preferred by urban and semi-urban consumer/retailer owing to the desirable flavour of meat.
- ▲ Most popular among semi-unban farmers as backyard bird due to attractive plumage.

Production Performance of Nandanam B3

Parameters	Performance
Hatch weight (g)	41
8 th week weight (g)	1300
10 th week weight (g)	1500
12 th week weight (g)	1850
Feed efficiency up to 8 weeks	2.52
Livability (%) 0-8 week	95
Age at sexual maturity (days)	133
Weight at sexual maturity (g)	2635
Part – time egg production (25-40 weeks)	
HDEP (%)	47
HHEP (%)	46
Annual egg number	140
Egg weight (g at 42 weeks)	60
Adult livability (%)	97
Hatchability (%) on total egg set	68
Hatchability (%) on fertile egg set	83

The strain can be grown with good FCR and affordable cost of production even up to 12 weeks of age as the bird is performing well with better meat quality till the time. On farm trails carried out during 8th generation (2017-18) indicated that the birds are having the potential to reach an average body weight of 1.900 kg in 10th week itself.

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RESEARCH HIGHLIGHTS (2016-17)

Current status of *Mycobacterium avium* subsp. *paratuberculosis* excretors and the possible role as a zoonotic pathogen

Mycobacterium avium subsp. *paratuberculosis* (MAP) is now drawing attention as zoonotic pathogen due to possible role in Crohn's disease of humans. About 813 samples comprising milk (524 bovine, 59 caprine and 50 ovine), bulk tank milk (65) and dairy products (115) were screened to ascertain the presence of MAP in milk and milk products. Out of these samples 3.8% (20/524), 0% (0/50), 0% (0/50), 3.1% (2/65) and 0% (0/115) samples were positive by Ziehl-Neelsen staining while 30.7% (161/524), 14.0% (7/50) and 11.9% (7/59), 27.7% (17/65) and 0% (0/115) samples were positive by IS900 Polymerase Chain Reaction respectively. Further, questionnaire survey analysis using binary logistic regression revealed that deworming frequency, rearing system, dung removing frequency and disinfectant usage in farm were influencing the occurrence of MAP infection in animals. The high prevalence of MAP infection in present study warrants need of regulatory measures to combat the MAP infection in animals and humans.

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Phenotypic and molecular genetic studies on draughtability in Umblachery cattle of Tamil Nadu

- Draught power in Umblachery cattle was assessed through phenotypic traits, draughtability parameters, biochemical parameters and variations in candidate genes. Draughtability traits like stride length, speed of ploughing and horse power generated during ploughing averaged 1.20 ± 0.21 m, 0.95 ± 0.03 m/s and 0.39 ± 0.04 respectively in Umblachery bullocks. A strong positive correlation was observed among morphometric traits like body length, height at withers and chest girth, and draughtability parameters. The physiological parameters such as heart rate, pulse rate, respiration rate and rectal temperature were found to increase after work.

- The means of serum creatine kinase and lactate differed significantly between before (52.35 ± 5.04 U/L and 52.87 ± 8.22 mg/dL) and after (35.92 ± 4.17 U/L and 37.477 ± 3.846 mg/dL, respectively) work.
- The single nucleotide polymorphism (SNP) in ACE-1 gene at position 2620 (A>G) was significantly associated with body weight. Similarly, the genotypes 373/373 bp and 365/365 bp of VEGFA (ACAT)n microsatellite associated with lower levels of serum lactate and creatine kinase and 175/177 and 177/177 bp genotypes of VEGFA (GA)n microsatellite marker associated with lower levels of serum lactate are considered as the favourable genotypes. The optimum draft load at which Umblachery bullocks exhibited uniform and maximum power output was 75 to 78 kg. Thus, the genes ACE-1, BDKRB2 and VEGFA could be used as potential candidate markers for assessing draughtability in *Bos indicus* cattle.

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Diagnostic and therapeutic evaluation of haemorrhagic gastroenteritis in puppies

The main aim of the study was to identify the etiology and to evaluate haemorrhagic gastroenteritis in puppies below 6 months of age. Ten apparently healthy puppies were selected as control animals. In the clinical study, dogs presented with the history of vomiting and haemorrhagic diarrhoea were subjected to grading based on canine HGE Activity Index, with little modifications, and the grade III/ severely affected puppies were selected. Sixty two dogs under grade III, were classified into the following groups: Group II – viral enteritis, Group III – bacterial enteritis and Group IV – combined bacterial and viral enteritis. The enteropathogens and toxins identified in the puppies with haemorrhagic gastroenteritis were, canine parvo virus- 2b, canine distemper virus, clostridium perfringens – enterotoxin, c. perfringens – alpha toxin, clostridium difficile, escherichia coli – shiga toxin, and e. coli – enterotoxin. The gastrointestinal parasites identified were, *Toxocara* sp., *ancylostoma* sp., *taenia* sp., *cryptosporidium* sp., and *isospora* sp. All the animals under various groups were treated with a protocol of intravenous fluids, antibiotics, antiemetics,

Printed and Published by

Dr. N.K. Sudeep Kumar, Ph.D., Director of Distance Education i/c.,
on behalf of Tamil Nadu Veterinary and Animal Sciences University
and Printed at University Publication Division,
Madhavaram Milk Colony, Mathur Road, Ambathur Taluk,
Tiruvallur District, Chennai - 600 051.

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gastrointestinal protectants, oral probiotic/prebiotic/enzyme supplement and amino acid supplement. Most of the dogs had a history of gradual progressive signs ranging from inappetance to severe vomiting and haemorrhagic diarrhoea. All the dogs under grade III were presented in lateral recumbency, with moderate to severe dehydration. The changes in the physical parameters observed were increased respiratory rate in all the affected cases and hypotension among the non-survivors. Majority of the affected animals had clinical evidence of systemic inflammatory response syndrome. The haematological changes observed were, leukopaenia in the non-survivors of group II, leucocytosis and neutrophilia in group III, and neutropaenia in the non-survivors of group II and group IV. The biochemical changes observed in the affected puppies with haemorrhagic gastroenteritis were, hypoalbuminemia, hyperbilirubinemia and hypokalemia. The acid base disturbance observed was compensatory metabolic acidosis. Hyperlactemia was observed in non-survivors. The faecal ABST sensitivity pattern in the affected puppies was, Gentamicin > Azithromycin > Enrofloxacin > Cefotaxime > Tetracycline. The resistance pattern observed was, Amoxicillin > Tetracycline > Enrofloxacin > Cefotaxime > Azithromycin > Gentamicin. The dogs under various groups, treated according to the protocol, recovered between day 5 to day 8, which was evident on scoring/grading based on the criteria such as changes in appetite, vomiting frequency, stool consistency and frequency, dehydration (%), and the level of consciousness.

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Conception rate following synchronization of ovulation and fixed time breeding in tellicherry goats

The study was conducted to compare the efficacy of different synchronization of ovulation protocols on kidding and fecundity rates in Tellicherry goats during winter and summer seasons. Out of 240 Tellicherry does selected, 120 does used during winter and 120 does used during summer season. The selected does of each season were divided into Groups I, II, III, IV, V (Treatment groups) and VI (Control group). Group I, II, III, IV and V does were treated with intravaginal sponges, ovsynch, ovsynch+intravaginal sponges, cosynch and cosynch+intravaginal sponges, respectively. The does of group VI were bred by natural selection or artificial insemination during the observed oestrus. During winter season the percentage of kidding rate in natural selection and artificial insemination were 80.00, 80.00, 90.00, 80.00, 80.00 and 70.00 and 40.00, 70.00, 70.00, 60.00, 70.00 and 50.00 per cent in groups I to VI, respectively. The percentage of kidding rates with natural selection and artificial insemination were 60.00, 70.00, 80.00, 70.00, 70.00 and 60.00 and 50.00, 60.00, 60.00, 50.00, 60.00 and 50.00 in groups I to VI during summer season, respectively. The overall kidding rates in natural selection during winter and summer season were 80.00 and 70.00 per cent and artificial insemination during winter and summer seasons were 60.00 and 55.00 per cent, respectively. From this study, it is concluded that ovsynch plus intravaginal sponge found to be the best protocol in terms of increased kidding and fecundity rates in Tellicherry goats in winter and summer seasons.

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