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SPORTING PERFORMANCE – HIDDEN TRUTH FOR REJUVENATION OF INDIGENOUS CATTLE GERMPASM IN TAMIL NADU

Genetics has great influence over components of the athletic performance in livestock other than known production and reproduction traits, which is nothing but survival of the fittest in the particular environment over the years of evolution. As a result, they are endowed with strength, muscle power, endurance, flexibility, neuromuscular coordination, temperament and other phenotypes that could be used as camouflage at the time of predator attack. Moreover, athletic status in domestic animals is a heritable trait and on an average 66 per cent of the variance is explained by additive genetic factors. The remaining variance is due to non-shared environmental factors. Muscular strength and power are important components of fitness for the execution of a sporting activity, which is typically a quantitative, multi-factorial phenotypes, influenced by both multiple genes (polygenic) and environmental factors in livestock. In this scientific background, many sporting events were conducted in rural areas of India to exploit the real potential of livestock in ancient days.

Out of many sporting events, this article introduces the topic of bullfighting, as the iconic, most popular; but controversial, instance of a highly diversified class of human–animal relations, to be called, for lack of a better term, “human-initiated agonistic animal contests,” namely fights or deadly confrontations with, or between animals, initiated by humans. These contests fall into two broad subclasses: animal-versus-animal contests, in which animals fight one another and managed by humans; and human-versus-animal contests, in which humans fight or show supremacy over animals. The first contest was banned throughout the world to prevent cruelty towards animals and the second contest is happening in some countries to maintain cultural milieu and sustainability.

Other Sporting Events in India

Sl. No.	Name of the sporting event	Home state
1	<i>Cock fight</i> - blood sport between two roosters (cocks), or more accurately gamecocks	Andhra Pradesh during the festival of Sankranti
2	<i>Kambala</i> - an annual Buffalo race (he-buffalo) held traditionally under the auspices of local landlords	Coastal Karnataka
3	<i>Bail gadi shariat</i> - Bullock cart races for long, a source of recreation and entertainment for farmers	Rural Maharashtra
4	<i>Camel race</i> - Horse and camel race during the Pushkar fair period to attract the crowd	Rajasthan
5	<i>Bulbul fights</i> - the fights organized in every Sankranti, coinciding with harvest festival	Assam

Scenario in Tamil Nadu

Bull-baiting or Jallikattu was a traditional sporting event evolved by our ancestors for selective breeding of *Bos indicus* cattle to propagate the superior native germplasm of excellent draught quality. This event will be helpful to maintain the genetic diversity of indigenous bulls and prevent them from extinction. Five draught cattle breeds are present in Tamil Nadu namely Alambadi, Kangayam, Pulikulam, Umblachery and Bargur. Out of which Pulikulam, Kangayam, Umblachery and non-descriptive cattle participate in Jallikattu. Indigenous cattle breeds are mainly used for draught purpose, capable of working with much endurance. This sporting event brings about the inherent genetic qualities, which are suitable to become breeding bulls after their sporting life for producing superior offspring. Those bulls are herd animals and by nature they exhibit aggression at the time of mating in herds for position of dominance when compared to other breeding bulls in herds. The animal breeders mate aggressive animals to produce offspring with more aggression and they create the generation of bulls with bucking ability and aggressive tendency (Smith *et al.*, 2011).

This sporting event is also known as bull hugging or bull embracing or bull taming. The existence of this event is accredited by Sangam literature in the scripts of *Kalithogai* and *Mullaikali*. The bull-seal of Indus Valley Civilization (4000 to 6000 years ago) and the coin of Pandiyan Kingdom depict the persistence of this sport in antique days. In historical days, the event was associated with socio-cultural ethos of Tamil people such as to exhibit bravery of the bull tamers and those bull tamers preferred by females as their bride grooms for marriage; bulls were raised in the name of god, given to daughter as gift in marriage are followed in this day and age also. It is held in the rural areas of Tamil Nadu to mark the harvest festival, from January to July every year in Madurai, Pudukottai, Trichy, Thanjavur and Salem districts.

There are three kinds of *Jallikattu* namely *Vadi manju virattu*, *Vaeli virattu* and *Vadam manju virattu* conducted in Tamil Nadu. *Vadi manju virattu* is known as *Jallikattu*, in which a coloured cloth is firmly tied around the horns of the bull and some gold / silver coins or rupees were knotted around the forehead (Littlewood, 1936). As the bull comes out from the entry point (*vadi vasal*), one person hugs the hump of the bull to restrain and shows his valour to the audience. *Vaeli virattu* held in the districts of Sivagangai and Madurai, where the bulls were released into the open field and run in any direction where they prefer to attack. In *Vadam manju virattu*, bull is tied with 15ft long rope and allowed to move within that surrounding area, teased by giving sound by persons around the bull and tried. Modernization in agriculture and increasing proportion of dairy cattle decrease the usage of animals for agricultural purposes. But, these sorts of sporting events are rejuvenating the existing native germplasm in their breeding tract by continuous supply of bull calves for breeding to maintain the genetic variability. Due to a temporary ban of *Jallikattu* event, those priceless bulls were sold for slaughter at very low cost.

Sports genomics is a quite new scientific discipline initiated in the early 2000s after cracking the human DNA structure and discovery of first genetic markers associated with sporting performance. Now, DNA profiling of sporting animals and sports performance are developing into a tool for the examination of sporting activity and selection of sturdy animals. Besides sports genomics, these age-old traditions will bring about lot of advantages.

- ▲ This event would reveal the genetic potential of the indigenous bulls in sporting events thereby help in propagating the superior native germplasm and preventing them from extinction in future.
- ▲ It would help in keeping up the cultural legacy and economic sustainability for stakeholders.

References on request

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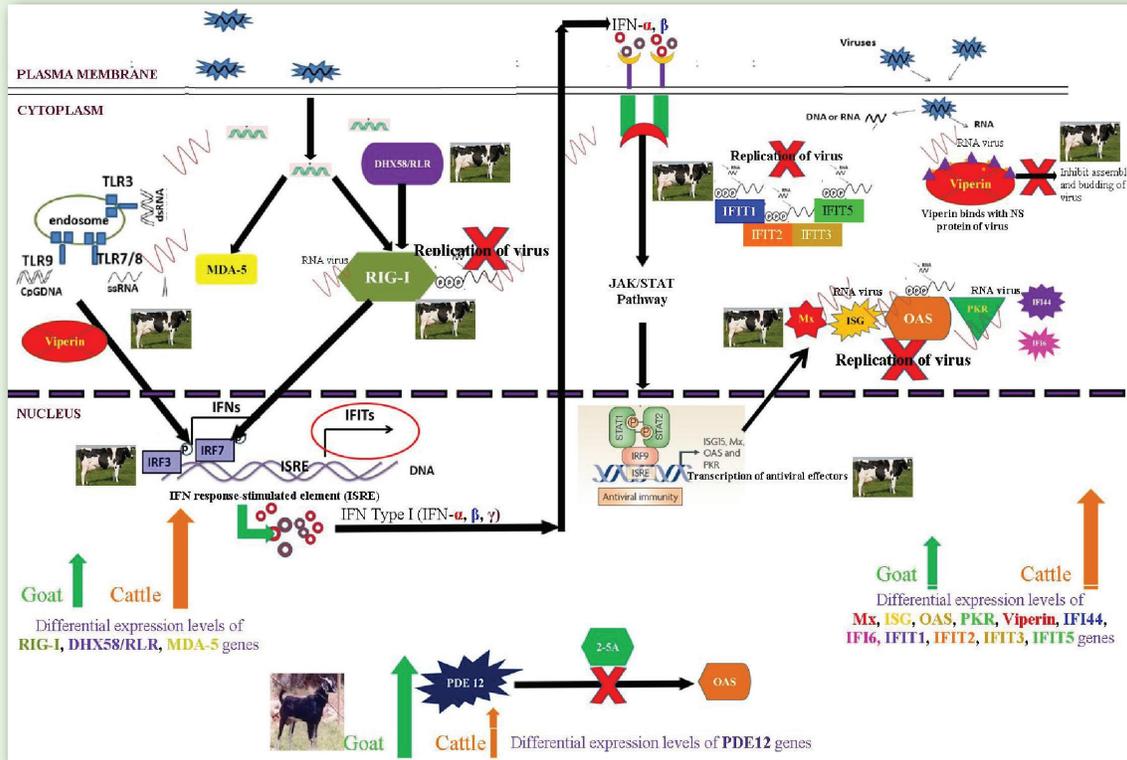
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RESEARCH HIGHLIGHTS (2016-17)

Understanding differential host disease resistance to *Peste des petits ruminants* (PPR) in small and large ruminants

- Five complete genomes of PPRV were sequenced and phylogenetic analysis confirmed all the isolates belonged to lineage IV of PPRV and genetically distinct from the earlier isolates from India.



- Transcriptome analysis was carried out on RNA extracted from goat and cattle PBMCs infected with PPRV at 24 h PI. PPRV infection in goat PBMCs caused upregulation of 43 genes and downregulation of 12 genes while in cattle PBMCs there were 112 genes upregulated and 7 genes downregulated.
- Based on the results, it is postulated that the possible pathway for genetic disease resistance against PPRV in cattle is predominantly due to the upregulation of IFN alpha pathway.

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AICRP on post-harvest engineering technology

- The technology devised to extract collagen and chondroitin sulphate from animal by-products resulted in better utilization of animal by-product and also decreased environmental pollution.
- The flaying cradle has been designed and fabricated which would facilitate hygienic flaying and hence, minimized contamination of the carcass and ultimately resulted in superior meat to the consumer.
- Drying beef in the Solar drier for a period of six hours under the Sun, followed by 16 hours of electrical drying and another six hours drying under the Sun is effective in bringing down the moisture of beef from 76.07 to 19.60 per cent.

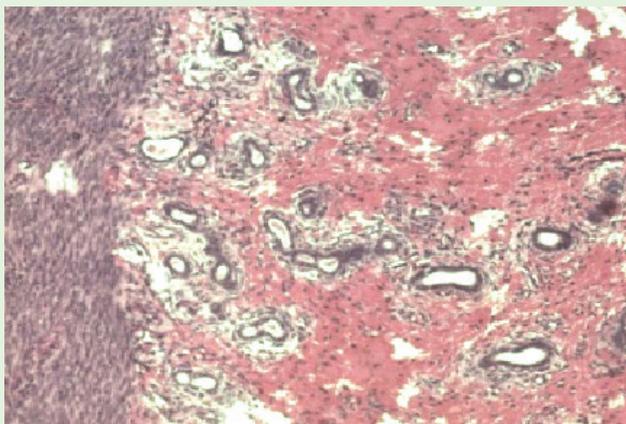
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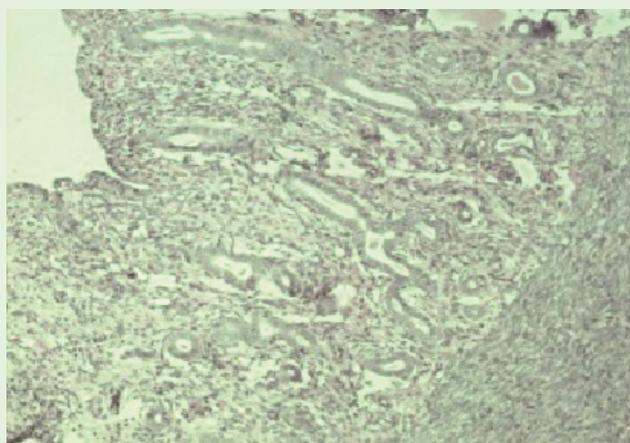
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Evaluation of endometrial histology and nuclear morphometry in diagnosis of uterine disorders in bitches

- ▲ Endometrial histology can be employed in correlating the normal cases brought for breedig advice with cases of reproductive failure, so that causes for the later may be identified with one step forward in diagnosis of infertile cases



Histopathological evidence of reduction in thickening of stromal region and the endometrial glands indicative of anestrus



Hyperplastic endometrial epithelium with coiled endometrial glands indicative of diestrus

- ▲ Nuclear morphometry can also be employed in predicting the reproductive capacity of the bitch by measuring the nuclear parameters of endometrial samples

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Economic dimensions of migratory sheep farming in Southern Agroclimatic Zone of Tamil Nadu

- ▲ Socio-economic profile revealed that majority of the sheep farmers were Hindus, most of them belonged to backward community and half (more than 50 per cent) of them were illiterate. Most of the farmers belonged to middle age group (35-45 years) and majority of the farmers had 20-40 years of sheep farming experience (55 per cent).
- ▲ The overall return per rupee of investment was found to be 1.42. The farms need to produce 415 kg/annum to attain breakeven point and to operate the sheep farm without any profit or loss, the farmers had to rear a minimum number of 42 number of animals.
- ▲ The factors like flock size, education, occupation, experience, landholding and distance of migration were found to influence the profitability.
- ▲ The analysis of sheep farming revealed that flock size, labour charges, medicine and vaccination charges were underutilized in overall category of farmers and the mean technical efficiency of the farms was 88 per cent.

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