

GOVERNMENT OF INDIA
MINISTRY OF FISHERIES, ANIMAL HUSBANDRY AND DAIRYING
DEPARTMENT OF ANIMAL HUSBANDRY AND DAIRYING
LOK SABHA
UNSTARRED QUESTION No. 3899
TO BE ANSWERED ON 17TH MARCH 2020

CONSERVATION AND PROMOTION OF INDIGENOUS COW BREEDS

3899. SHRI RAKESH SINGH:

Will the Minister of FISHERIES, ANIMAL HUSBANDRY AND DAIRYING

मत्स्यपालन, पशुपालन और डेयरी मंत्री

be pleased to state:

(a) whether any study has been conducted regarding the benefits of the milk of cows of indigenous breeds to human health;

(b) whether it has been found in the researches that the A2 quality milk obtained from cows of indigenous breeds is more beneficial for human health;

(c) if so, the details thereof; and

(d) if so, whether the Government proposes to take any steps for conservation and promotion of indigenous cow breeds?

ANSWER

**THE MINISTER OF STATE FOR FISHERIES, ANIMAL HUSBANDRY AND DAIRYING
(DR. SANJEEV KUMAR BALYAN)**

(a) to (c) As informed by Indian Council of Agricultural Research (ICAR) that ICAR has not undertaken any study on benefits of A2 milk in human beings. However, under a National Fund project on “Delineating Beta Casein Variants in Indian Cows and Potential Health Implications of A1A2 Milk”, ICAR-National Bureau of Animal Genetic Resources (NBAGR), Karnal and ICAR-National Dairy Research Institute (NDRI), Karnal have undertaken a study on effect of A1A1, A1A2 and A2A2 milk feeding on type 1 diabetes and coronary heart disease in animal model (mice). The outcome of the study is annexed as Annexure-I

(d) In order to complement and supplement the efforts made by the States/Union Territories for development and conservation of indigenous bovine breeds Government of India has been implementing Rashtriya Gokul Mission for development and conservation of indigenous bovine breeds. The detail of the major steps undertaken under Rashtriya Gokul Mission for development and conservation of indigenous breeds is at Annexure-II.

Details of the outcome of the study undertaken by ICAR on effect of A1A1, A1A2 and A2A2 milk feeding on type 1 diabetes and coronary heart disease in animal model (mice)

The study was conducted to establish experimental evidence for the cause and effect relationship of different concentrations of BCM-7 (Beta casomorphin 7) and BCM-9 (Beta casomorphin 9) peptides in C57/BL6 mice for 23 and 51 days of treatment

A1A1, A1A2 and A2A2 milk based diet fed for 3, 6 and 9 months

A1A1, A1A2 and A2A2 milk based fed diet in combination with streptozotocin (STZ)-treated mice for diabetes progression

A1A1, A1A2 and A2A2 milk based fed diet in combination with high fat diet for obesity.

During the trial periods, data on various hematological parameters, glucose, insulin, LFT, KFT, inflammatory cytokines, cortisol and other biochemical parameters was generated. The mice were sacrificed at an interval of 3, 6 & 9 months and tissue (liver, kidney and pancreas). The histological data for liver, pancreas, spleen and kidney were generated. The findings of our study suggested subtle changes in some of the blood and biochemical parameters.

The results indicated that there was a significant ($p < 0.05$) increase in TNF-alpha level in mice group injected with BCM-7/400 μ g (162.2 ± 4.702 pg/ml) in comparison to BCM-9/400 μ g (109.2 ± 3.12 pg/ml). Similarly the level of IL-6 was significantly ($P < 0.05$) higher in mice group injected with BCM-7/400 μ g (11.65 ± 0.916 pg/ml) in comparison to BCM-9/400 μ g (7.06 ± 0.53 pg/ml). Histological examination of the pancreas from mice injected with 400 μ g of BCM-7 for 23 and 51 days showed focal area of necrosis with infiltration of lymphocyte while 400 μ g of BCM-9 injected group showed only mild congestion. Interestingly, liver in both the groups (400 μ g of BCM-7 and BCM-9) showed vacuolar degenerative changes, pyknotic nuclei in hepatocytes with intense eosinophilic cytoplasm and infiltration of lymphocytes in portal areas though to a different extent.

In the feeding trial wherein only A1A1, A1A2 and A2A2 milk powder based diet was given to mice for 3, 6 and 9 months, histological examination of the liver from mice fed with A1A1 genotype milk based diet revealed fatty changes and cellular swelling at all the three time points of trial. In other two groups (A2A2 and A1A2), the fatty changes were not observed even after 9 months of feeding. However, in A1A2 group, cellular swelling was observed after 6 months of feeding that persisted till 9 months of trial as well. Liver amyloids were observed in mice group fed with A1A1 & A1A2 diets at the stage of 9 months but not in A2A2 milk based diet. The kidney tissues from mice fed with A1A1 diet showed focal interstitial nephritis at all three time points of trial. The signs of degenerative changes observed in the kidney of mice fed with A1A1 diet at 3 months of trial eventually got transformed to hyaline degenerative changes indicating time dependent progression. Kidney samples from mice fed with A1A2 diet showed cellular swelling in renal tubules after 3 months which sustained till completion of trial period. However, the hemorrhages in focal areas were observed only after 9 months of trial. No abnormality was detected in islets of Langerhans in pancreas of mice from all the 3 groups with progression of time, though in between

acinar cells some fibrous tissues were observed in A1A1 group. Conversely, no major changes were detected in kidney, liver or pancreas of mice group fed with A2A2 milk powder based diet.

The present study has helped to record the crucial histological changes on some selected tissues of mice fed with A1A1, A2A2 and A1A2 based milk diets. Amongst the three group, the mice group fed with A2A2 milk powder based did not reveal any major abnormality compared to mice groups fed with A1A1 and A1A2 based milk diets.

EFFORTS MADE UNDER RASHTRIYA GOKUL MISSION FOR DEVELOPMENT AND CONSERVATION OF INDIGENOUS BOVINE BREEDS

a) Conservation of Indigenous Bovine Breeds

- i) Gokul Gram: 21 Integrated indigenous cattle development Centres – “Gokul Grams” have been sanctioned under the Rashtriya Gokul Mission with the aim of conservation and development of indigenous bovine breeds in a scientific and holistic manner.
- ii) National Kamdhenu Breeding Centre: Two National Kamdhenu Breeding Centre (NKBC) as repository of indigenous germplasm of all indigenous breeds and supply certified germplasm to the farmers undertaking rearing of indigenous breeds and increasing their stock have been sanctioned.
- iii) Pashu Sanjivni: Animals in milk are identified under the Pashu Sanjivni using poly urethane tags with 12 digit unique identification number and their data is uploaded on INAPH database. As on date 13.03.2020, 3.24 crore animals tagged and their data have been uploaded on INAPH data base.

b) Breed Improvement by Modern Reproductive Techniques

- i) Establishment/strengthening of Embryo Transfer and In-Vitro Fertilization centres: Projects for strengthening/ establishment of 30 ETT/IVF labs have been sanctioned for propagation of elite animals of indigenous breeds and to meet demand of bulls of indigenous breeds. Out of 30 labs approved under the scheme 14 labs have been made functional.
- ii) National Bovine Genomic Centre for Indigenous Breeds (NBGC-IB): Funds have been released to National Bureau of Animal Genetics Resources and National Dairy Development Board for development of genomic chip. A custom made genotyping chip (INDUSCHIP) which is suitable to genotype Indian cattle breeds and their crosses has been developed by National Dairy Development Board (NDDB) and till date 15,574 animals have been genotyped in order to create referral population. NDDB has developed buffchip for genomic selection of buffaloes and till date 4,320 buffaloes have been genotyped.
- iii) Establishment of Facility for Sex Sorted Semen Production: Projects from 12 semen stations Gujarat, Haryana, Kerala, Karnataka, Madhya Pradesh, Maharashtra Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand, Punjab and Himachal Pradesh have been sanctioned and Central Share has been released to 11 stations. The use of sex sorted semen will not only enhance milk production but also crucial in limiting population of male cattle/ stray cattle.

c) Genetic upgradation through traditional techniques:

- i) Progeny Testing: Milk production is a sex limited trait therefore genetic potential of the bull is estimated by the performance of the daughters. The scientific breeding method for estimating predicted transmitting ability of bulls on daughters' performance is termed as progeny testing. 14 Organised Progeny Testing Programmes (PTP) initiated under NDP-I have been subsumed under Rashtriya Gokul Mission since March 2019. During 2019-20 (upto December 2019), 291 progeny tested bulls produced under the programme

ii) Pedigree selection: Under the programme, male calves are selected on the basis of pedigree details and performance of dam, sire and other ancestors in the pedigree. The pedigree selection programmes initiated under NDP-I have been subsumed under RGM since March 2019. During 2019-20 (upto December 2019), 39 High Genetic Merit bulls produced under the programme.

d) Extension of Artificial Insemination Coverage:

i) Nationwide Artificial Insemination (AI) programme: Nationwide Artificial Insemination programme has been launched on 11th September 2019 for implementation in 605 districts with less than 50% Artificial Insemination coverage covering 300 villages per district and 20,000 animals per district. The programme is extended to all the districts of North eastern States and Union Territory Jammu and Kashmir. Under the programme 39.36 lakh animals covered and 19.5 lakh farmers got benefitted as on date 13.03.2020.

ii) Krishi Kalyan Abhiyan: Artificial Insemination Coverage (AI) with High Yielding Indigenous Breeds in the 112 aspirational districts identified by Niti Aayog has been implemented during 2018-19. Under the programme 9.05 lakh animals covered using semen of High genetic merit bulls of indigenous breeds.

e) Awareness Program:

i) National Gopal Ratna and Kamdhenu Awards: In order to create awareness and reward for farmers and Institutions who are engaged in scientific management of recognized Indigenous cattle breeds, National Gopal Ratna and National Kamdhenu Award have been instituted under Rashtriya Gokul Mission.

ii) E Pashu Haat Portal: E Pashu Haat portal has been developed for connecting breeders and farmers regarding availability of quality bovine germplasm of indigenous breeds. Information of 11.61 crores semen doses; 363 embryos and 18.13 lakh live animals are available on the portal as on date 13.03.2020.