

available for commercialization, benefiting the community, which can have direct access to the resultant genetic material from decades of selection.

IMPROVEMENT OPPORTUNITIES

Worldwide buffalo production points out to the necessity of selecting of animals that produce milk with bigger industrial efficiency and for the shortening of generation interval. Embrapa Eastern Amazon has prioritized the identification of animals that can produce milk with functional characteristics and that are sexually precocious. It is expected that, in a few years, these characteristics can be spread to the Institution's herd and to the productive sector.

NEW TECHNOLOGIES

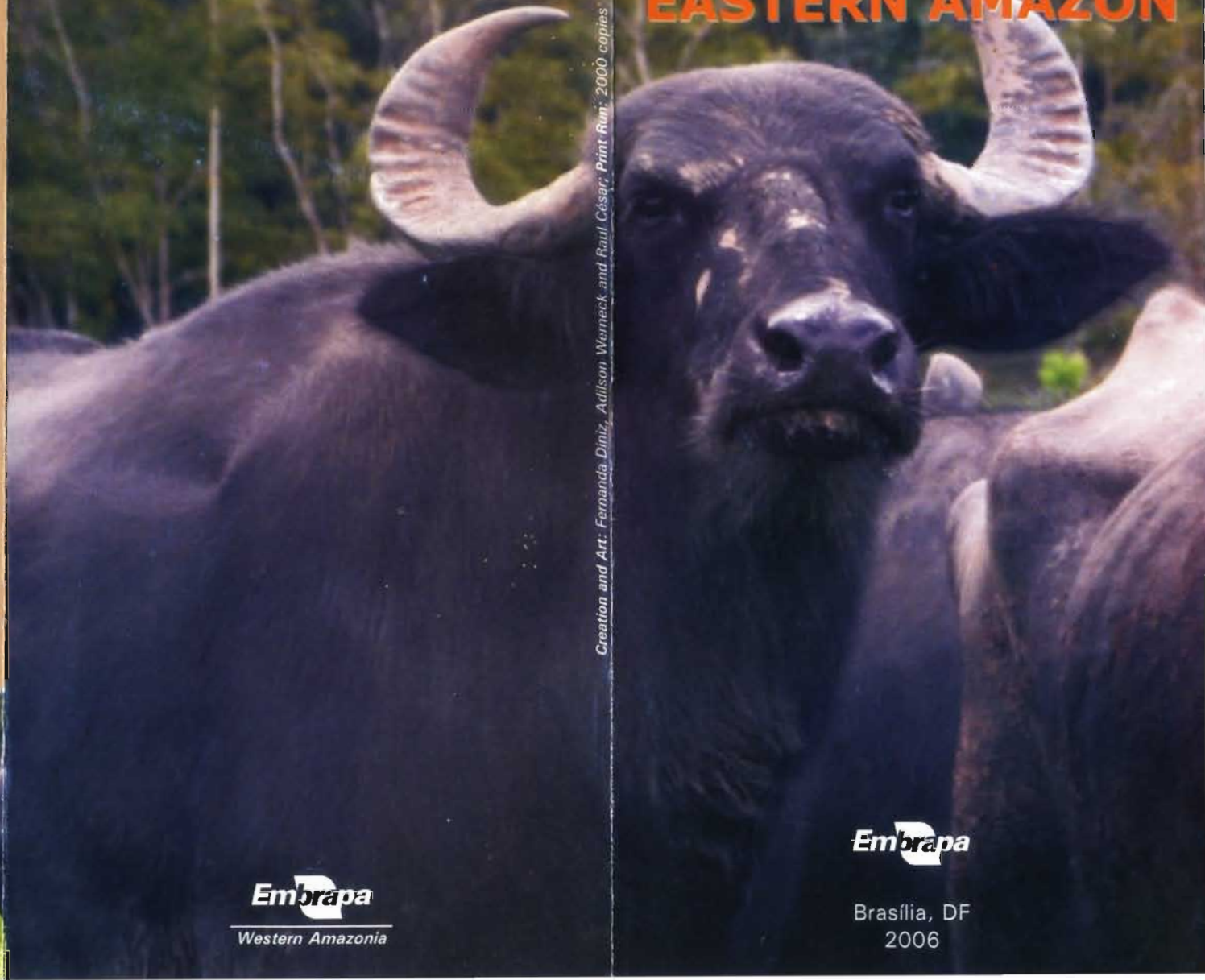
Although the obtained results are still not ideal, Embrapa is carrying out research projects with embryo transfer, a powerful tool for the multiplication of genetic material from females. Also, develops activities aiming the diffusion of superior genetic material in the Amazon region, as protocols of estrous control and ovulation synchronization, which have allowed the insemination of a great number of buffalos, in a practical and fast way, avoiding estrous detection routines. At the same time, the identification of superior bulls whose thawed semen presents more adequate characteristics for fertilization, also, is part of the recent research of Embrapa. Thus, the parallel use of new technologies of reproduction with identification of the most productive animals has contributed to the fulfillment of our institutional mission, which is, "make possible solutions for the sustainable agricultural development, with emphasis in the agribusiness, by means of the generation, adaptation and transference of knowledge and technologies, in benefit of the diverse segments of the Brazilian society".



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GENETIC IMPROVEMENT OF WATER BUFFALO AT EMBRAPA EASTERN AMAZON



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WHY CHOOSING THE WATER BUFFALO

The water buffalo is a docile and long-lived animal, easily managed and capable of adapting to different ecosystems. This allows that it is raised in many regions of Brazil, even under somewhat hostile conditions. Its harmonic relation with the environment is indispensable to the modern processes of animal certification. The water buffalo is capable of converting, efficiently, fodder of low nutritional value and producing meat and milk of high quality leather for the manufacture of carpets, clothes, covering, security gear, etc. Its milk has high total solid contents (approximately 18%), being ideal for the manufacture of delicate cheeses and other delicacies. Its meat is flavorful, of pleasant consistency and coloration, with low cholesterol content. Its rusticity, docility and physical vigor make of it a useful animal, also, as a draft animal, mainly in poor communities and places where the characteristics of the land make it difficult the access engines or other animals.

THE WATER BUFFALO AT EMBRAPA EASTERN AMAZON

The water buffalo herd of Embrapa was acquired during the 1950's, by Dr Felisberto Camargo, the former director of the Instituto Agrônomo do Norte (today, Embrapa Eastern Amazon). The acquisition of those selected animals started the research activities with this species in the Brazilian Amazon region. Currently, animals

of Murrah, Mediterranean, Carabao and Jafarabadi breeds, besides the Baio type, form the buffalo herd of Embrapa. Herds are kept at Research Stations, located in Belém, Monte Alegre (Low Amazon Region) and Salvaterra (Marajó Island), State of Pará. The conservation of the buffalo's genetic material of biological interest has been carried out by the Bank of Animal Germoplasma of the Amazon, with emphasis for the Carabao breed and the Baio type.

THE IMPROVEMENT FROM 1950 TO 1991

The search for the sustainability of Amazonian production systems emphasizes the selection of more productive and easily managed animals. Since the beginning of the activities, Embrapa keeps its buffalo herd with the double intention to serve as model for research and to confer greater productivity to the future generations. From 1950 to 1991, the improvement was based on production characteristics and mating was carried out under natural or controlled regimen. In 1979, the first generation of pure animals of the Murrah breed was born, as a result of successive crossing. This generation was called "Murrah of Cpatu". These animals were disseminated for the formation of new buffalo herds and the consequent improvement of the national herd. During years, bulls as Rajah, Calicut, Rotak Moti de Santa Helena and Ronco da Primavera sired at Embrapa. These bulls would become later national references of animal breeds for milk and meat production.

THE IMPROVEMENT FROM 1950 TO 1991

With the beginning of the activities of artificial insemination in buffaloes, Embrapa started to adopt this technology as routine. The new tool allowed the researchers to increase the selection pressure, using more intensely improved bulls and diminishing the degree of inbreeding of the herds, planning crossings among animals of distinct families, whose semen was imported by Embrapa from countries as Italy and Bulgaria. At that time, the incorporation of research based on silvipastoral systems was decisive for advancing of the knowledge on the ambience and maximum expression of the genetic potential of the buffaloes, generating the ecological, economic and social sustainability of productive systems.



REPRESENTATIVE ANIMALS OF EMBRAPA

The genetic improvement carried out by Embrapa and the cooperation with other Research institutions (Universidade Federal do Pará e Universidade Federal Rural da Amazônia) and with the local and the Brazilian and Buffalo Breeders Associations have generated very positive results for the buffalo raising activity in Brazil. Parallel to the innumerable information generated by research with production systems, such as animal nutrition, animal and forage management, ambience, animal health and buffalo reproduction biotechnology, Embrapa has generated exponents of animal production, such as Limeira, a cow that reached expressive production of 4.645 kg of milk/365 days of lactation. Bulls from Embrapa herd have taken part on the Program of Genetic Improvement of Buffaloes (PROMEBUL) and their frozen semen is