

# EXCLUSION OF ADMIXED ANIMALS FROM CIKA CATTLE *IN SITU* CONSERVATION USING SNP HAPLOTYPES

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## Objective

The aim of the study was to establish an objective basis for an assessment of possibly purebred animals in the *in situ* conservation program of the indigenous admixed cattle breed Cika.

## Introduction

- Cika cattle - indigenous breed in Slovenia
- Herd book (July 2015): - 1.191 breeding females  
- 2.486 animals of all categories
- A part of the population was admixed with other breeds in the past

## Material

- 106 Cika animals
- 654 animals from 14 reference breeds



Cika cattle (photo: M. Simčič)

## Results

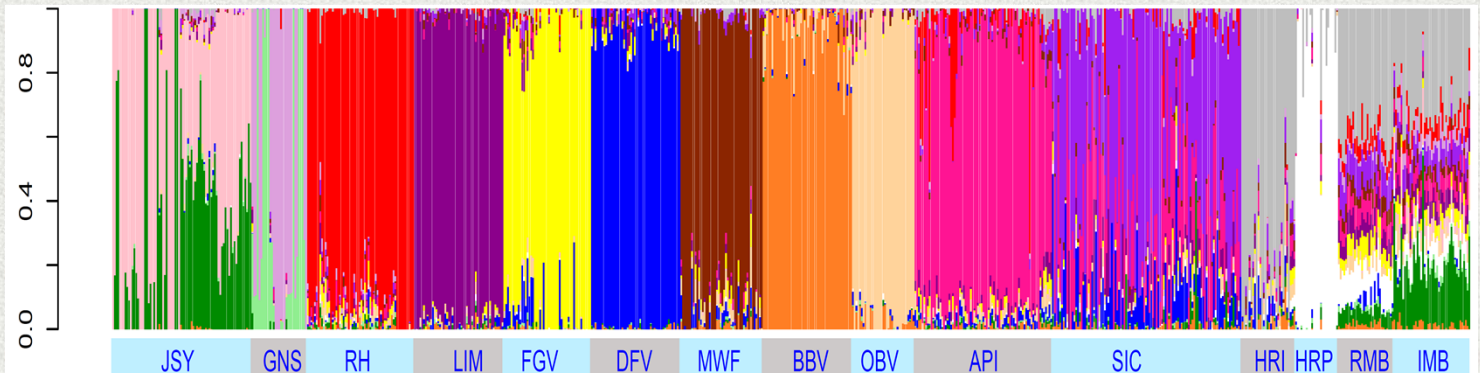
- Some Cika animals are significantly admixed with Pinzgauer, Fleckvieh, Red Holstein, Jersey, Limousin or Braunvieh.
- Paternity analyses and distribution of admixed animals suggested previously unrecognised crossing.
- These intentionally crossed animals should not be confused with ancient admixtures observed in all animals and all breeds.
- Animals identified as the most purebred were proposed for a breeding nucleus with the original genetic background.

## Conclusions

- Successive inclusion of reference breeds demonstrated that power for identification of foreign haplotypes in the admixed population depends on the availability of possibly complete spectrum of haplotyped reference populations.
- Conservation and recovery approach should rely on the identification and removal of introgressed haplotypes what would be more powerful than the search for the original genetic background.

## Methods

- Genotyping – Illumina BovineSNP50 BeadChip array
- Realised genetic relationship – IBD (identical by descent) matrix (760 x 760)
- Degree of admixture (program *ADMIXTURE*;  $K = 15$ )
- IBD complemented by genetic structure in *ADMIXTURE*



### Genetic structure from *ADMIXTURE*

JSY – Jersey, GNS – Guernsey, RH - Red Holstein, LIM – Limousin, FGV - Franconian Gelbvieh, DFV - German Fleckvieh, MWF - Murnau Werdenfelser, BBV - Brown Swiss, OBV - Original Braunvieh, API – Pinzgauer, SIC – Cika, HRI - Istrian cattle, HRP - Slavonian – Strymian Podolic cattle, RMB - Red Metochian Buša, IMB - Illyrian Mountain Buša