

STRATEGIC PRIORITY AREA 1: CHARACTERIZATION, INVENTORY AND MONITORING OF TRENDS AND ASSOCIATED RISKS

Actions undertaken during the past year

- (a) *Demographic relieves*;
- (b) *individual typification* as prodrome for the safeguard of biodiversity and characterization of a food product of animal origin to identify some biomolecules with particular 'nutritional', 'extranutritional' and 'health' value, to achieve a dynamic status of human welfare (*from fork to farm, food, health and well being*); in particular:
- *determination of chromosomal set* to identify possible natural, both numerical and structural chromosomal modifications, by banding karyotype analysis;
 - *localization on the chromosomes* of particular DNA sequences by FISH technique (*Fluorescence in Situ Hybridization*);
 - *evaluation of genome stability* by SCE test (*Sister Chromatid Exchange*) and micronucleus test;
 - *evaluation of nuclear and/or mitochondrial DNA "oxidative" damage* induced by ROS (*Reactive Oxygen Species*) through *Comet test*;
 - *Individuation of polymorphisms* in:
 - *genetic markers*: microsatellites or STR (*Short Tandem Repeat Sequence*) or SSR (*Simple Sequence Repeat*), AFLP (*Amplified Fragment Length Polymorphism*); RFLP (*Restriction Fragment Length Polymorphism*), RAPD (*Random Amplified Polymorphic DNA*), SNP (*Single Nucleotide Polymorphism*); CNV (*Copy Number Variation*) or CNP (*Copy Number Polymorphism*);
 - *loci candidate for quality characteristics of a food product of animal origin*: (i) CRC (*Calcium Release Channel*) or RYR1 (*Ryanodine Receptor*) or halothane locus in order to individuate carriers of mutated allele responsible for MH (*malignant hyperthermia*), which among the other things, causes 'exudative myopathy (PSE meat, *Pale Soft Exudative*); (ii) RN (*rendement Napole*) or PRKAG3 (*protein kinase AMP-activated γ 3 subunit*) locus in order to individuate carriers of mutated allele responsible for detrimental meat characteristics (lowering of water holding capacity and transformation yield); (iii) milk protein loci; (iv) H-FABP (*Heart-Fatty Acid Binding Protein*) loci; FASN (*Fatty Acid Synthase*), DECR1 (*Mitochondrial 2,4 Dienoyl – CoA Reductase*) and MC4R (*Melanocortin Receptor 4*), involved in fatty acid metabolism;
 - *determination of transcriptome profile* by *microarray* approach validated by *PCR Real time* to characterize, in a given moment of the cell cycle, simultaneously, 'not expressed' and 'expressed' DNA segments and, for the latter, the 'differentially expressed' segments due to environmental and genetic factors;
 - *meat quality*: (i) rheological characteristics on raw and cooked meat; (ii) colorimetric profile of some muscles; (iii) chemical centesimal composition;
 - *milk quality*: somatic cell count, pH measures, determination of chemical centesimal composition (water, lipids, proteins, lactose and minerals) and renneting aptitude of milk obtained from genetic types (GTs) and ancient autochthonous genetic types (AAGTs) subjected to regular milk recordings according to *International Committee for Animal Recording* (ICAR) official standards;

- *characterisation of proteomic profile* of: (i) raw meat and its products (ham, ecc.) obtained from pig GTs and AAGTs controlled by I.NFP; (ii) dairy products obtained from cattle and sheep GTs and AAGTs controlled by I.NFP;
- *characterisation of peptide profile* of dairy products obtained from cattle and sheep GTs and AAGTs controlled by I.NFP;
- *characterisation of lipid profile* of: (i) ripened products obtained from pig GTs and AAGTs controlled by I.NFP; (ii) dairy products obtained from cattle and sheep GTs and AAGTs controlled by I.NFP;
- *characterisation of flavour profile* of: (i) ripened products obtained from pig GTs and AAGTs controlled by I.NFP; (ii) dairy products obtained from cattle and sheep GTs and AAGTs controlled by I.NFP;
- *characterisation of sensory profile (panel test)*;
- *reproductive characterisation*: (i) routine gynaecological controls; (ii) evaluation, through computerized sperm analysis system (*Hamilton Thorne Biosciences – IVOS*), of some somatic and kinetic parameters of sperm cell, among which: *path velocity* (VAP, $\mu\text{m}/\text{sec}$), *progressive velocity* (VSL, $\mu\text{m}/\text{sec}$), *track speed* (VCL, $\mu\text{m}/\text{sec}$), *straightness* (STR= VSL/VAP, %), *beat cross frequency* (BCF, Hertz), *Linearity* (LIN= VSL/VCN, %), *Lateral amplitude* (ALH, μm), *elongation* (ELON, %), *area* (μm^2).

Actions planned for the next year

Pursuing of all activity above cited, in particular, in the context of the following projects:

- (a) “Research and innovation in the activities of animal genetic improvement by molecular genetic techniques for the competitiveness of national zootechnical system”;
- (b) “Innovation of pig meat quality concept”;
- (c) “Safeguard of biodiversity for the innovation in the obtainment of ‘local typified labeled’ food product of animal and vegetable origin”;
- (d) “Valorization of AAGT Casertana pig ‘pure’ and Casertana x GT D.IT crossbred”;
- (e) “Microsatellite typification of sheep genetic types reared in Continental Sud Italy”;
- (f) “Breed traceability of sheep meat by molecular approach”;
- (g) “Model of hunting – faunae plan for the safeguard of wild faunae (permanent and migratory faunae)”.

2. STRATEGIC PRIORITY AREA 2: SUSTAINABLE USE AND DEVELOPMENT

Action undertaken during the past year

- *Participation to the organization of training courses*: (i) “Superior technician in animal production in the context of the Pole for training of superior technician for the research development in the Southern Italy”; (ii) “Chemical –biological Superior technician for the environmental control and safeguard”; (iii) “Superior technician for the environmental safeguard of ‘protected areas’”.
- *Research projects*: (i) “Development of sustainable and multifunctional models of farms for pasture valorisation in marginal areas by GIS in the Southern Italy”; (ii) “Operative models of animal biodiversity utilisation in the Middle (Toscana and Lazio) and Southern Italy (Basilicata, Calabria, Campania and Puglia) in order to promote environmental sustainability”.

Action planning for the next year

Pursuing of all activity above cited.

STRATEGIC PRIORITY AREA 3: CONSERVATION

Actions undertaken during the past year

Conservation activity in the context of the following projects:

- (a) "ERFP Call for action 2007 - 2008 - *in situ* conservation ”;

(b) “Rescue and models of safeguard of cattle, goat, equids, pig and sheep AAGTs in Italy”.

Actions planned for the next year

Pursuing of all activity above cited.

STRATEGIC PRIORITY AREA 4: POLICIES, INSTITUTIONS AND CAPACITY BUILDING

Actions undertaken during the past year

- “Economical and biogenetic of breeds and populations at limited diffusion”; action totally by Agriculture, Food and Forestry Ministry .
- Cooperation for the definition of “National Plan on biodiversity of agrarian interest”, set up by Agriculture, Food and Forestry Ministry (Department of developmental politics – General Management of rural development) still under realization .

Actions planned for the next year

- Pursuing of all activity above cited.
- Definition of projects for reorganizing genetic banks of zootechnical interest at national level thanks to the cooperation of National Committee for Biosafety, biotechnology and life sciences (Presidence of Ministers Council).

In particular, in this period, ConSDABI has written 21 papers and 10 technical – divulgative publications