



Consiglio Nazionale delle Ricerche

## Institute for the Animal Production System in the Mediterranean Environment (ISPAAM)



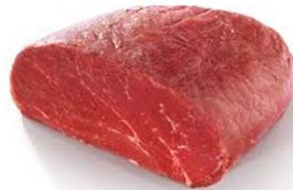
DiSBA



<http://www.cnr.it/istituti/DatiGenerali.html?cds=083>

<http://www.ispaam.cnr.it>

## Scientific themes, Mission & Strategic role



- ISPAAM chief aims concern the maintenance/enhancement of the forage-livestock system sustainability by optimizing the yield-quality-security-safety of the products, responding to consumer/market requests, ensuring animal welfare and minimizing farm environmental impact
- The whole productive system is considered, moving from plant-animal biology and farming to microorganism use up to food product quality
- ISPAAM takes interdisciplinary interest on Animal production research themes by using a systemic approach that combines knowledge & methods from different scientific areas
- It acts as an active center for the study of above-mentioned themes in the Mediterranean areas & privileged counterpart for relations with similar research Institutions from other countries

### Strategic Areas DiSBA

- Biology, Biotechnology and Bioresources
- Agriculture, environment and forestry
- Food productions and Nutrition

# Institute for the Animal Production System in the Mediterranean Environment

## Historical perspective and Site Localization



1974 - Institute for the study of bovine and buffalo adaptation to the Italian Mezzogiorno environment (IABBAM-NA)

2002 – Merging with the Center for the study of the Mediterranean grazing lands (CSPM-SS) to generate ISPAAM

Staff: 46 units (26 researchers) + about 18 research associates, fellows, and students

Geographical distribution of the staff units





# Institute for the Animal Production System in the Mediterranean Environment



1. Bioagronomy of native Plant species for Forage production & Multipurpose uses

8. Sustainable development of Farming & Agropastoral systems

7. Rumen & Food Microbiology

6. Bio-agricultural Proteomics & Metabolomics

5. Study of Animal/vegetable-derived Foods & Materials



2. Animal Breeding & Nutrition

3. Animal Physiology

4. Animal Cytogenetics & Genomics

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## 1. Bioagronomy of native Plant species for Forage production & Multipurpose uses

- Germoplasm collection of native plant/microorganism species
- Forage legumes for pasture, fodder & alternative uses
- Forage quality & seasonal distribution
- Monitoring of pollutants in pastures
- Biomass production for energetic purposes

## 2. Animal Breeding & Nutrition

- Animal polymorphisms
- Optimized diets
- Feedstuff degradability & feeding efficiency
- Animal management
- Homeopathic remedies for calving/lactation periods

## 3. Animal Physiology

- Redox stress in healthy/diseased animals
- Endocrine regulation of fat deposition in growing animals
- Animal Biomarkers of energetic status/fat accumulation

## 4. Animal Cytogenetics & Genomics

- Genetic improvement detecting silent chromosome aberrations
- Environmental pollutants & chromosome fragility
- Genome sequencing
- Chromosome characterization & standard karyotyping
- Cytogenetics maps in animals with unknown genome

## 5. Study of Animal/vegetable-derived Food & Materials

- Food chemistry of animal/vegetable resources
- Characterization of physico-chemical, nutritional & technological properties of animal/vegetable resources
- Maillard reaction products
- Bioactive metabolites from grassland species

## 6. Bio-agricultural Proteomics and Metabolomics

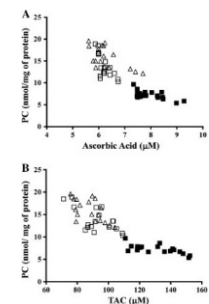
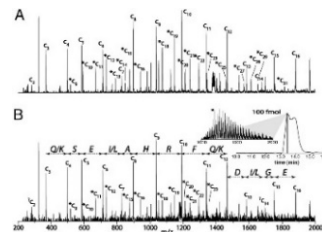
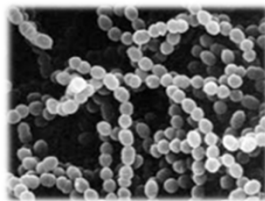
- Expression/functional Proteomics of species with Bio-agricultural Interest
- Metabolomics of species with Bio-agricultural Interest
- Biomarkers of a healthy/diseased condition in Animals & Plants

## 7. Rumen & Food Microbiology

- Rumen Microbiology
- Dairy & Meat product's Microbiology
- Microorganisms with detoxifying capacity

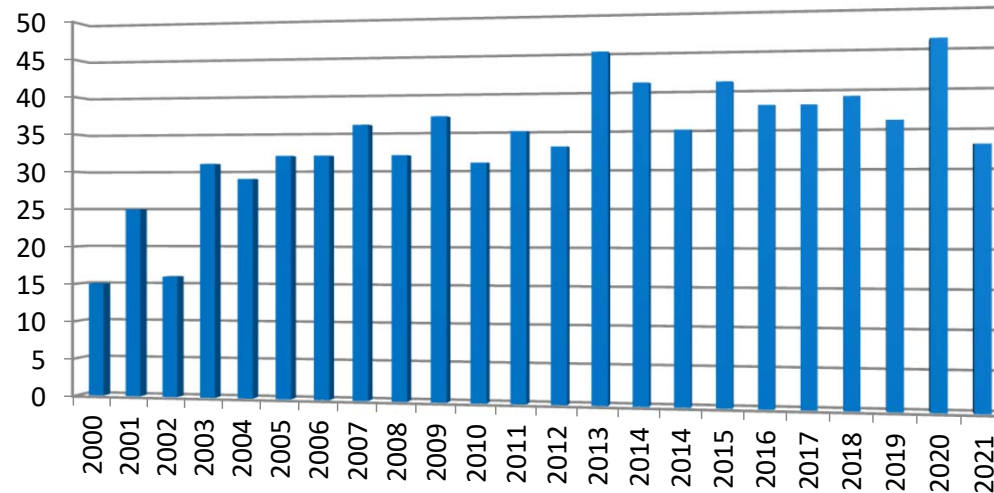
## 8. Sustainable development of Farming/Agropastoral systems

- Use of perennial forages in rainfed farming systems
- Use of native species in dry farming environments
- Socio-economic impact of traditional/innovative farming practices
- Modelization for farm management

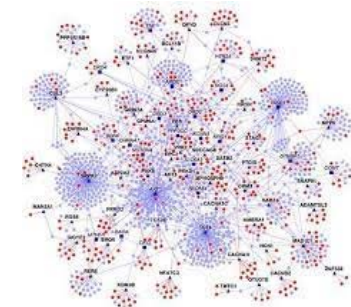
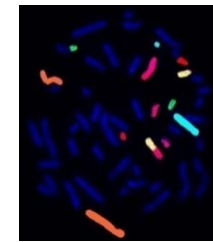
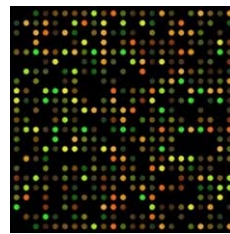
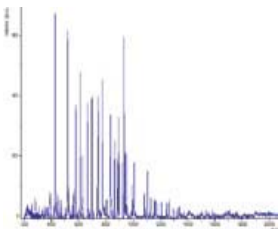


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## Scientific Publications



- **435 publications (426 IF & 9 no IF) in ISI journals/books (2011-2021)**
- **2.05 publications/researcher per year (2011-2021)**
- **About 17 articles with IF close or higher than 10 (2011-2021)**
- **Average IF (3.95 and 2.79 for IF and all journals, respectively)**
- **196 multidisciplinary publications; 141 ones with foreign countries (2011-2021)**

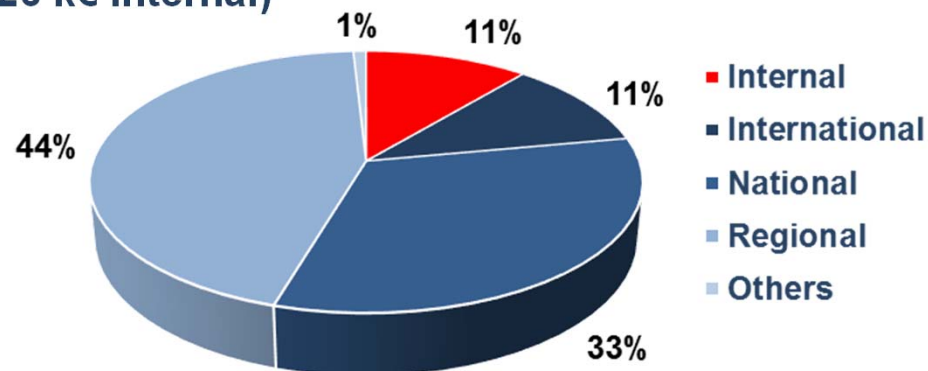




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## Research Grants (2015-2021)

- Total funding: about 2600 k€ (2574 k€ external, 26 k€ internal)
  - about 39 k€/researcher/year
- 45 External grants (2021)
  - Regional (21 grants)
  - National (16 grants)
  - UE/International (6 grants)
  - Others (2 grants)



Innovation for grassland management



Looking for an ecosustainable sheep supply chain: environmental benefits and implications



IBISBA<sup>1.0</sup> Infrastructure for Industrial Biotechnology



Infrastructure for Promoting Metrology in Food and Nutrition



FNS-Cloud

Food Nutrition Security - Cloud



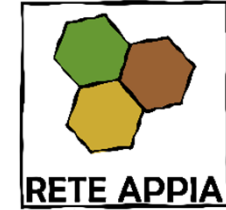
# Main projects with Italian stakeholders

- Project CISIA "Conoscenze Integrate per Sostenibilità ed Innovazione del *Made in Italy* Agroalimentare" (MIUR) – with CNR Institutes active in the agricultural environment, ENEA and various agrifood companies/consortia
- Project RARECA "Razze autoctone a rischio di estinzione della Regione Campania" (PSR-Regione Campania) - with UNINA and the Experimental Zooprofilaptic Institute of the Italian Mezzogiorno
- Project QUARC-CAMPUS "Qualità delle produzioni tipiche campane ed il loro territorio: approcci innovativi ed integrati per rafforzare la competitività del sistema agroalimentare" (POR-Regione Campania) – with various CNR Institutes and Regional agrifood companies/consortia
- Project CRP24901 – Legge 7 "Ricerca di inquinanti su animali/vegetali in aree del territorio considerate a rischio ambientale ed esame delle possibili conseguenze a livello della catena alimentare" (Regione Sardegna) – with various CNR Institutes and UNISS
- Project CRP25377 – Legge 7 "Analisi integrate, fitosociologiche e fitopastorali al fine di applicare uno strumento di gestione della risorsa silvo-pastorale pubblica dell'Ogliastra" (Regione Sardegna) – with various CNR Institutes and UNISS





# Stakeholders involved in recent funded projects



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## Attractiveness data (2015-2021)

ISPAAM research lines/groups always attracted young researchers that completed their Post-Doc/PhD/Research fellow/Thesis activities in Institute laboratories. Data matched historical ones (2000-10), showing that about 70 PhD/Thesis students from Italian Universities were trained at ISPAAM, thus proving the **strong interaction with academies** & the attractiveness of its **multidisciplinary environment**

In most cases, attractiveness data were related to the activity of ISPAAM excellence groups. These scientists were distinguished for their actual research lines, quali-quantitative publication performances, capacity to attract external funds & editorial, congressman, contact person or divulgation activities, which highly qualified ISPAAM outwards

In 2015-21, about **30 young researchers** spent training periods in the Institute labs taking advantage of different temporary contracts from ISPAAM external grants. Worth mentioning was also the presence of young scientists from **Iran, Nigeria, Peru, Russia, Montenegro & Romania** that were involved in ISPAAM activities. These data **confirm the strong internationalization of ISPAAM action**

Post-Doc & Visiting scientists	13	4
Research Fellows	4	2
Post-graduate Fellows	7	
Short-term Research Contractors	9	
Volunteer Research Fellows	10	



Among young scientists formed at ISPAAM, **4** obtained a **permanent position at CNR**, **1** obtained a **permanent position at Sari University (Iran)** and **2** obtained a **temporary position at CNR (2011-2021)**.

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## Outreach activities (2015-2021)

ISPAAM personnel participated in:

- Official delegation of Italian scientists promoting research exchange activities, Italian Embassy, Ottawa, Canada
- Scientific Secretariat of the Sub-Network on Mediterranean Forage Resources, FAO-CIHEAM Inter-regional Cooperative Research & Development - Network on Pastures & Fodder Crop
- Continuing Committee Membership, International Grassland Association
- Executive Committee & Scientific Advisory Board Memberships, European Grassland Federation
- Board of Directors Membership, ProdAI scrl - Campania Regional Centre of Competence for AgriFood Productions, Salerno, as delegate for strategic recommendations & high level consulting
- Executive and Scientific Committee Membership, FUTURIDEA, Benevento, as delegate for strategic recommendations & high level consulting
- CNR x EXPO Committee Membership, EXPO2015, Milan, for organization, strategic recommendations & high level consulting
- European Expert Group Membership, Agricultural European Innovation Partnership
- Grant evaluation Committee, Croatian Science Foundation (Croatia), Wolfson Research Merit Awards-Royal Society (England), Dutch Technology Foundation STW (the Netherlands), Canada Foundation for Innovation (Canada) and National Science Center (Poland)
- Italian Ministry of University & Research Evaluation Group Membership, for consulting activities



EMBASSY OF ITALY  
OTTAWA



CIHEAM



FUTURIDEA  
INNOVAZIONE UTILE E SOSTENIBILE

CNR x EXPO

INNOVATION.CA  
CANADA FOUNDATION FOR INNOVATION | FONDATION CANADIENNE POUR L'INNOVATION



MINISTERO DELL'ISTRUZIONE,  
DELL'UNIVERSITÀ E DELLA RICERCA

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## Professional awards and editorial/educational activities (2015-2021)

- Classification at Rank 25-30 (depending on year) in the Top Italian Scientists Interdisciplinary ranking, VIA Academy
- Habilitation to full and associated professorships, MIUR  
3 full professorships in 05/E1, 05/E2 and 07/E1 (2013-2021); 5 associated professorships in 05/E1 and 07/G1 (2013-2021)



- Associate Editor, Guest Editor & Editorial Board Memberships  
*J Grass & Forage Sci, J Proteomics, Chromosome Res, J Appl Genet, J Int OMICS, Front Plant Sci & Int J Mol Sci*
- Referees for ISI journals revising a multitude of manuscripts submitted for publication
- Invited Plenary & Keynote Lectures in a number of International/National Congresses
- Faculty Board Memberships in PhD schools at the University of Sannio & the National Institute for Metrological Research
- About 20 Tutoring activities PhD/Graduate students from UNINA, UNISANNIO, UNISI and UNISS
- About 20 Teaching activities in various Universities & Scientific schools present in the National territory, and high schools in the Campania & Sardinia regions

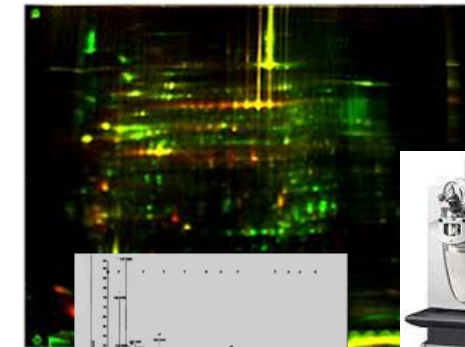


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## Technology transfer & Technological service activities

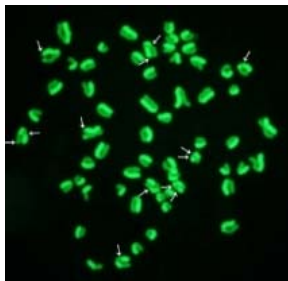
### Technology-transfer activities with professional associations, productive consortia & agriculture/farming stakeholders

- National Breeder Association of Buffalo Species for supporting farmers with karyotype analyses of reproductive bulls & females with fertility problems
- Establishment of 2 experimental fields in South Morocco sites
- International Buffalo Federation training course on Buffalo Management & Industry
- Activity with Tunisian, Moroccan & Libyan stakeholders
- Activity with members of the Australian farmers association ASHEEP
- Various field day meetings with farmers/stakeholders to share know-how
- Activity with Sardinian farmers for improving performances of sheep farms
- Various meeting to show the use of farm animals as environmental sentinels in polluted areas



### Technological service activities

- Water, soil and forage analysis
- Sediment analysis
- Proteomic analysis of biological matrices from organisms with bio-agricultural interest
- Mass spectrometry analysis of small organic/large biomolecules
- Cytogenetic analysis of farm animals used for breeding with karyotype certification
- Cytogenetic maps by FISH analysis
- Environmental monitoring by specific cytogenetic tests on animals raised on pasture
- Diet formulation support for farm animals
- Characterization of foods for zootechnical use
- Analysis of antinutritional and toxic elements in foods for zootechnical use & in animal-derived products
- Elaboration of production/management function models in animal farms
- Analysis of physiological stresses in domestic animals
- Food-borne & environmental microorganisms analysis



# Institute for the Animal Production System in the Mediterranean Environment



**LS9, WP 2014-2016**  
**Call 'Applied Life Sciences & non-Medical Biotechnology'**

THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

**HORIZON 2020**

**SC2, WP 2014-2015**  
**Call 'Sustainable Food Security'**  
**Safe food and healthy diets**

**LS2, WP 2014-2016**  
**Call 'Genetics, Genomics, Bioinformatics & System Biology'**

**Research Infrastructures**  
**MetroFood – Infrastructure for promoting Metrology in Food & Nutrition**

## **Development of activities/opportunities for Business & Research stakeholders**

- **Scientific excellence**
- **Integration with other Research Institutions**
- **Assistance in agro-industrial activities through the offer of technological services and cooperation in applicative Research studies**

# Institute for the Animal Production System in the Mediterranean Environment



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