



**International Topical Meeting on  
Nuclear Research Applications and Utilization of Accelerators**

**ADVANCES OF E-BEAM PROCESSING FOR  
FOOD PRESERVATION IN BRAZIL**

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# Food Irradiation

## *Present Status*

- 🌱 Increasing international trade of foodstuffs
- 🌱 Increasing regulatory requirements
- 🌱 Concerning about food safety
- 🌱 Healthy food x Safe food

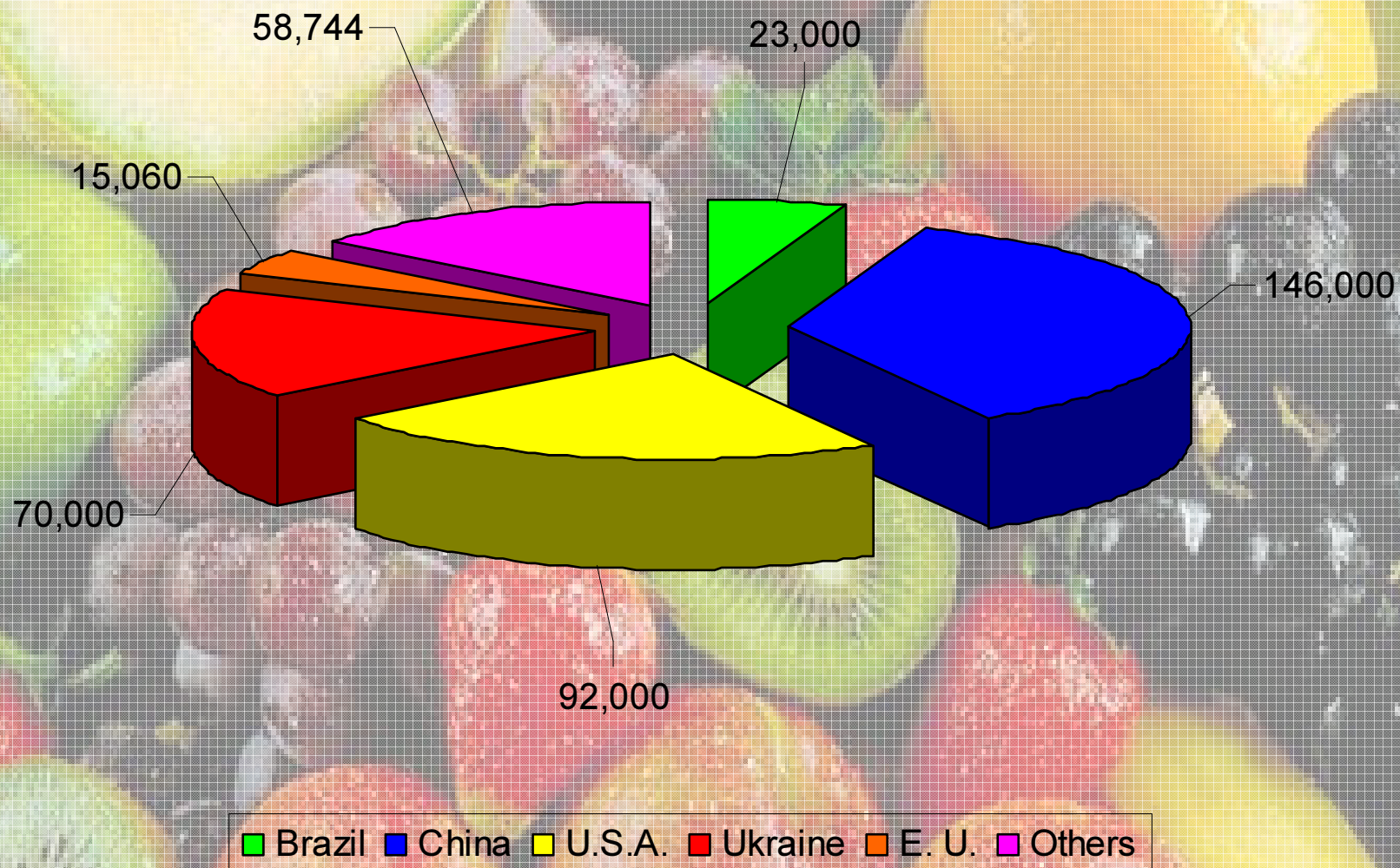


# Current E-beam applications in Brazil

- ☀ Polymers modifications
- ☀ Radiotherapy
- ☀ Sterilization of medical devices
- ☀ Pharmaceutical sterilization
- ☀ Food Irradiation



# Food Irradiation Brazil vs. World - 2005



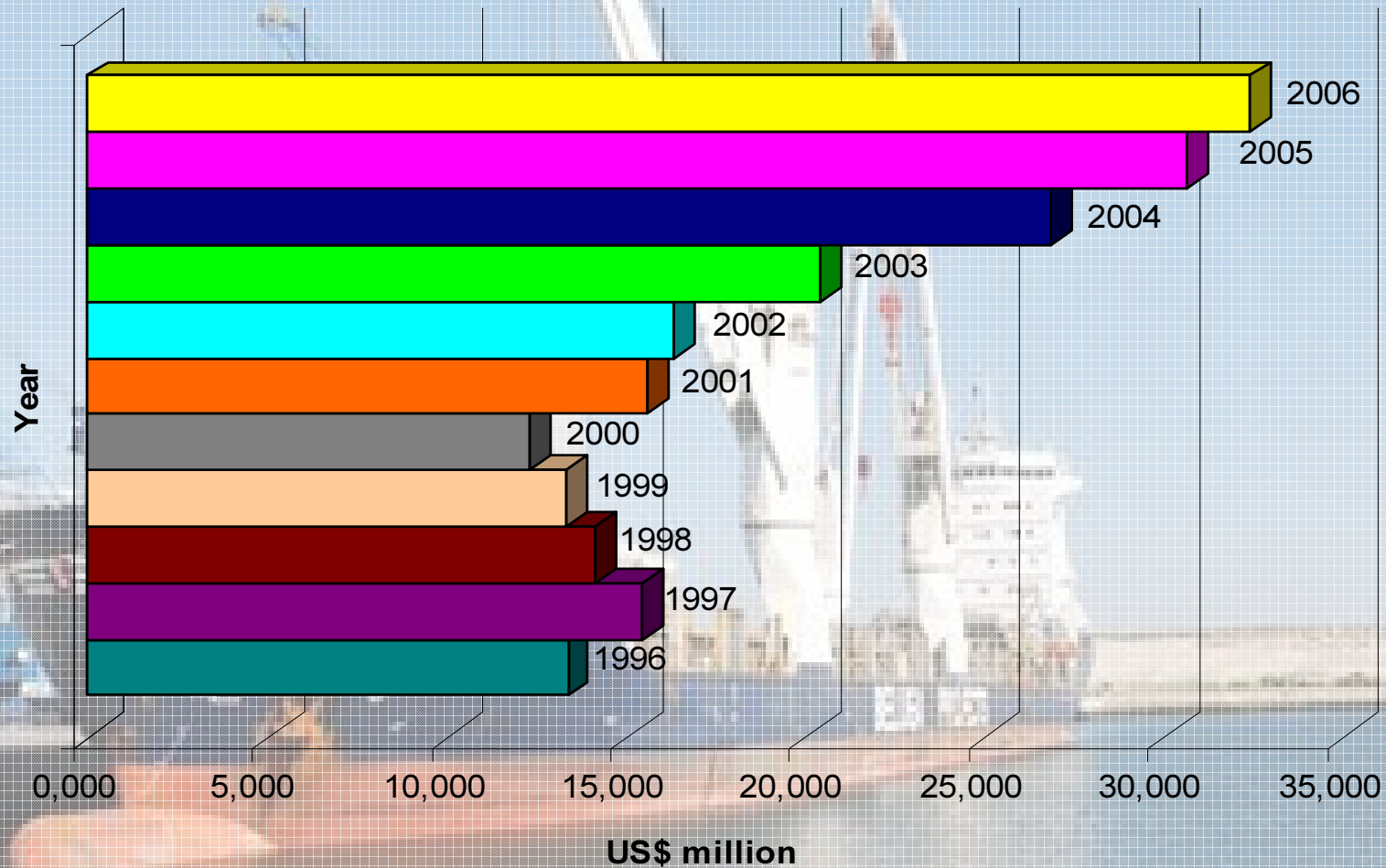
(Values in tons)

Kume *et al.*, 2009



# Brazilian Trade Balance

## *Agricultural Exportations*



[http://www.agricultura.gov.br/pls/portal/docs/PAGE/MAPA/ESTATISTICAS/COMERCIO\\_EXTERIOR\\_BRASILEIRO/8.1.B.XLS](http://www.agricultura.gov.br/pls/portal/docs/PAGE/MAPA/ESTATISTICAS/COMERCIO_EXTERIOR_BRASILEIRO/8.1.B.XLS)





# **Brazilian Legislation**

## **Brazilian Resolution #21 (2001)**

“...any food can be irradiated taking into account the minimum and maximum dosage applied, and the lowest dose should be sufficient to achieve the intended purpose and the maximum, less than that would jeopardize the functional properties and/or sensory attributes of food...”



# Irradiation Services

→ Ten gamma rays facilities

→ Six E-beam accelerators

02 IPEN (Research and Industry)

JOB-188 (1.5MeV, 25mA) / JOB-307 (1.5MeV, 65mA)

03 Polymers modifications (mainly)

01 Industry (Several applications)

Titan Beta 18/10 (18kW, 10MeV)

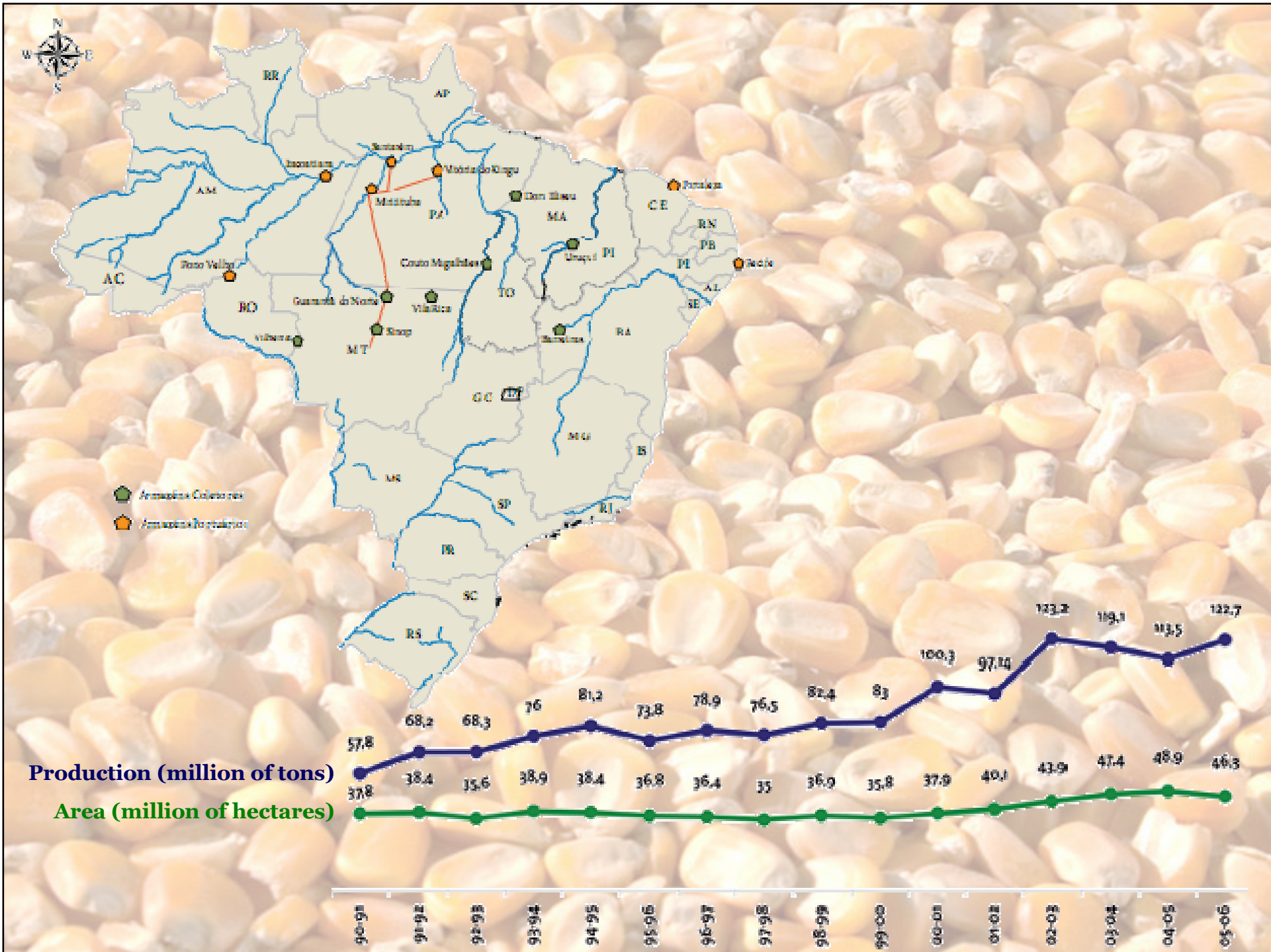




## **Future Necessities**

- E-beam radiation vs. gamma rays
- Difficulties in obtaining and shipping isotopic irradiators
- Future trend is a gradual growth in this technology







# Acknowledgments

# Thank you!



Secretaria da Ciência, Tecnologia,  
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e Turismo



Ministério da Ciência  
e Tecnologia



**CNPq**  
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