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From 'cuy' in South America to 'cavy' in sub-Sahara Africa: advancing development through South-South cooperation

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Introduction

Neglected and underutilized small livestock species such as domestic cavy (also known as 'cuy', 'cobaye' or 'guinea pig') (*Cavia porcellus* L.) can play a vital role in better nutrition, poverty reduction and income generation, especially for women and youth. Cavy is indigenous in South America where it has been domesticated (Spotorno et al. 2006). This small animal was introduced to sub-Sahara Africa (SSA) long ago, where it has an extensive distribution from Senegal in the West to Tanzania in the East. The remarkable adoption by smallholder farmers and peri-urban dwellers of a simple, apparently suitable food source has not received much international attention (Bacigale et al. 2014; Maass et al. 2014; Niba et al. 2012) and cavies are not even included in any African national livestock census except in Tanzania (NBS 2012).

Cavy Culture in Sub-Sahara Africa and South America

In SSA-countries, animals mostly roam freely in the kitchen or house and are kept in a way comparable to the traditional one in South America (Chauca et al. 1995; Morales 1994). In SSA, cavies are a source of meat, a flexible source of cash income – particularly used for schooling expenses – and an appreciated source of manure (Maass et al. 2014; Matthiesen et al. 2011; Meutchieye et al. 2015; Yiva et al. 2014). In many SSA-countries (e.g., Cameroon, Côte d'Ivoire, DR Congo and Tanzania), predominantly women and/or teenage boys engage as cavy keepers and sellers in local markets (Fon et al. 2014; Kouakou et al. 2011; Maass et al. 2014; Meutchieye et al. 2015). Cavies are also promoted as an alternative to the consumption of bushmeat so as to conserve wildlife in forest zones (Niba et al. 2012) and they have been included in humanitarian 'starter kits' for displaced people in conflict areas (Maass et al. 2014).

In South America, 'cuyes' have a very long tradition in Quechua regions of the Andean countries, especially in Peru (Morales 1994) and Ecuador (Archetti 1997). Improvement programs of cuyes over the past 60 years in Peru (Table 1) have yielded earlier maturing, heavier breeds (FUDECI 2000). Several breeds were released in the recent past: 'Perú' in 2004, 'Andina' in 2005, 'Inti' in 2013 and 'Sintética' in 2016 in Peru. Further, improved husbandry and

optimized feeding have enhanced cuy production (FUDECI 2000). Increased production, along with market-improving measures and general economic development in South America (Table 1), has led to increased consumption.

Today, cuyes are also consumed in non-traditional areas of Bolivia and Peru. Cuy products are exported at small scale from Ecuador and Peru to the USA and other countries for a market derived from South American immigration. A 'cuy boom' is currently underway in Peru with many more restaurants offering cuyes on their regular menu, some being specialized cuy outlets. Cuyes have also entered the Peruvian gourmet cuisine of renowned chefs such as Gastón Acurio and Virgilio Martínez (El Comercio 2010, 2014). Despite their wider use, cuyes remain associated with magic powers such as cuy soup being suggested to help cancer patients.

Table 1 History of improving cuy production in Peru; modified from compilation by C. Barrantes-Bravo (2016, unpublished)

Period	Changes and advancements
1963 – 1969	• Beginning technification of cuy husbandry
1970 – 1980	• Consolidation of first supporting institutions • First development of cuy technology
1980 – 1990	• First private experiences of commercial cuy husbandry
1990 – 2000	• Development of national cuy events • Increase of urban demand for cuyes • Beginning of some cuy exportation
2000 – 2010	• Promotion of commercial cuy husbandry • First release of improved cuy breeds • Development of Peruvian gastronomy • Increase of local tourism
2010 – 2016	• New challenges: - Disease prevention - Lack of forages - Value chain problems

In most African countries, however, formal knowledge about optimal cavy husbandry is restricted. Production systems are simple and animal mortality is high, which, in part, is a consequence of inbreeding due to poor reproduction management. High inbreeding levels have been established in cavy populations from Côte d'Ivoire (Kouakou et al. 2015) and Cameroon (Poutounyinyi et al. 2015; Wikondi et al. 2015) through the application of molecular markers. Where cavies are used for food in SSA, their potential is not being adequately realized because of a range of production constraints, and its high nutritional value is not being recognized by national agencies and communities because of a range of policy and cultural perceptions. This must change.

Towards South-South Cooperation

A project titled *Domestic Cavy: Improving husbandry and forage for alternative and rapid access to food and income for women and children in Cameroon and the eastern Democratic Republic of the Congo (DRC)* was carried out in partnership between the Biosciences eastern and central Africa Hub and the Commonwealth Scientific and Industrial Research Organisation (BecA/ILRI Hub–CSIRO) between 2011 and 2015. It showed that there is potential for livelihood improvement among smallholders through cavy-rearing and, as a consequence, researchers, development agents, practitioners and donors from sub-Sahara Africa, South America, Europe and Australia came together in the *International Cavy Symposium* in Yaoundé, Cameroon, in July 2016 to further identify opportunities for advancing cavy culture through South-South cooperation. While aiming to understand the multiple roles that cavies can have in enhancing livelihoods, paramount differences in cavy culture between the continents must be recognized.

The current situations of cavy culture in South America and that in sub-Sahara Africa are very different. Research in South America has enhanced the knowledge on cavy rearing over the past decades and several improved cavy breeds released in South American countries are available for use in enterprises. There are now many 'local champions' who apply best practice in cavy rearing, breeding and marketing to satisfy the demand for cavy meat and run profitable enterprises. As a traditional and cultural meat, cavy has high societal acceptance and even some export opportunities from South America. This Andean experience provides a wealth of

opportunity for learning and technology transfer to Africa. However, the language barrier means that little South American knowledge has made its way into African cavy culture.

Cavy culture is much less advanced in SSA. Cavy ownership is largely by women and youth; there is mainly an absence of taboos and only minor cultural boundaries for cavy production and consumption exist. Generally, meat is in high demand and cavies could help satisfy children's nutritional requirements. These are key factors underpinning the potential of cavy R&D in Africa. In addition, the previous cavy project has established new knowledge and Cavy Innovation Platforms at local and/or national levels in Cameroon and eastern DRC (Bacigale et al. 2014). These functional platforms can be useful models for cavy culture in South America, where still large proportion of the marketed cavies (e.g. about 70% in Peru) are produced in traditional family systems (C. Barrantes-Bravo et al. 2016, unpublished). Hence, there is opportunity for South-South knowledge exchange.

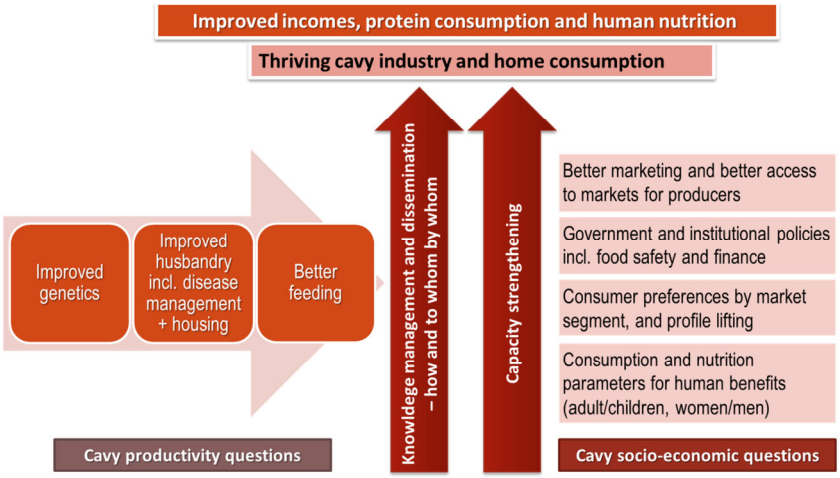

Figure 1 Research and development agenda for a future cavy project: Objectives and components

Prospects

A framework to advance a cavy production and consumption project in SSA was developed at the Yaoundé symposium (Figure 1). Such a project would need to be framed in terms of a path to impact, with specific objectives aiming to improve outcomes for both small-scale and semi-commercial producers. It should result in more cavy consumption in rural communities for improved human health impacts. Readily assessable objectives would be: (i) improved incomes for rural households and communities, especially for women and youth and, generally, (ii) better livelihoods. Enhanced value chains in terms of reliability and quality would also be targeted; this would result in higher demand and supply, and also safer food as value chains become more complex, longer, and food safety issues become more important as demand grows. Finally, the project would aim to develop broader and larger markets. While research and development questions would be around productivity and socio-economics. The core of the project has to emphasize knowledge management and dissemination together with capacity strengthening. The purpose of the planned South-South cooperation is to speed up progress by introducing and adapting knowledge from South America to Africa. The diverse production realities according to country have to be considered by conducting socio-economic, cultural, along with technological research and development to offer producers an array of suitable options.

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