

FAMILY PRODUCTION AND ANIMAL-HEALTH STRATEGIES

A. ZOTTELE¹, H. TAMAYO², S. BRIEVA³, L. IRIARTE³

¹*Pan American Foot-and-Mouth Disease Center (PAHO/WHO)*

P.O. Box 589, 20001-970 Rio de Janeiro, RJ, Brazil

²*Pan American Sanitary Bureau (PAHO/WHO)*

Av. Naciones Unidas, 1204 e Iñaquito,

Ed. del Club de Leones 4º piso, Quito, Ecuador

³*Facultad de Ciencias Agrarias, Univ. Nac. de Mar del Plata*

CC. 276, Ruta 226, Mar del Plata, Argentina

SUMMARY. The foot-and-mouth disease eradication programs have reached an advanced phase in several countries of South America. Likewise, other regions of the continent are free of the disease and engaged in developing prevention activities indispensable to prevent the introduction of the virus. In both situations there exists a broad sector of livestock raisers generically characterized as "small producers". These producers have, in good measure, accompanied the continental effort to eliminate the scourge. However, foot-and-mouth disease prevention and eradication will rest on weak bases if a more active participation by these producers is not encouraged. To this end, it is necessary to incorporate the foot-and-mouth disease programs as one more component of the development activities envisaged for the sector. This perspective demands a greater understanding of the characteristics of the family-level livestock production system on the continent and the course of the institutional policies implemented for the sector.

After a long period in which the concept of the State as the principal regulator of the economic and social activities predominated, the fundamentals of that function have come under scrutiny and reconsideration. The fiscal deficits and the inefficient use of resources, among other factors, contributed to the rampant discrediting of certain public activities and to the periodical inflationary processes with their sequels of speculation and problems of economic calculations for investment and spending.

These facts weakened the capability to respond to the various sectorial problems. In particu-

lar, the deterioration of the public veterinary services, their excessive degree of centralization and bureaucratization underscored the already limited capacity to introduce effectively, in the livestock-producing industry, significant changes in the behavior of the animal-health and production profiles.

The consensus that sustained the advantages of the public sector in orienting and leading development gave way in the face of models proposing free markets and privatization of state businesses as better levers for development. As part of the neoliberal proposals, the economic policies stimulated the drastic reduction of the State's functions as generator of goods and services. One consequence of this situation was the cutback of funding which affected both the sanitary labors of those who carry out the veterinary services and the

Reprint requests to:
Pan American Foot-and-Mouth Disease Center (PAHO/WHO).

motivation of the social segments related to the livestock industry.

Nevertheless, as some regions developed more acutely their capacity to analyze and understand the livestock-raising reality and the situation of animal health at the local level, the existing resources were identified and coordinated to produce veterinary attention services. This opened up the possibility of offering a better response to the problems of animal production.

The new situations urgently demand that alternatives for the small producers be included, considering their expectations and their potentials, which, moreover, is a requisite to increase their participation (8,9).

Five fields of action have emerged in this context, related to improving the animal-health profiles in the family-production areas:

- promote health in the development process by cooperating with livestock development in the family-production sectors;
- encourage the reform of the sector by means of processes for technical, administrative and financial decentralization of the Official Sanitary Services, so as to include the small producers in the so-called Local Veterinary Attention Systems;
- promote health from the concept that animal-health programs form a bridge between agriculture and public health;
- stimulate environmental protection and development associated with improvement of the animal-production profiles, in small producers' areas;
- support the control of diseases in the animal population which affect livestock production and public health.

In line with these ideas, this paper will discuss two topics. First, family production, or small production, and its strategic role in Latin American societies, will be characterized. Then suggestions will be submitted about a participatory approach to confront the changes in the animal-health profile in family-run agriculture and livestock-raising activities.

CHARACTERIZATION OF FAMILY PRODUCTION

Family agriculture

Family agriculture in Latin America possesses different characteristics by virtue of the varying historical and social circumstances of the stages that emerge from the configuration of the pre-Colombian cultures as well as from later processes of colonization.

The name "family producers" encompasses different realities, like that of the small (mini) landholders, peasant farmers, small producers, family producers, tenant farmers, sharecroppers, and others. Beyond the differences among these social sectors there are features in common for them all, such as the scarcity or lack of the resource land and capital and the family character of labor.

Some aspects of their heterogeneity find expression in significant differences in the pace of technological innovation and its adoption, in the level of productivity, and in the income. There are also differences in the levels of formal, informal and non-formal education, and in access to institutional credit (1).

The differences mentioned are seen among countries, among microregions within the same country, and within a single microregion. The image of a peasant agriculture, uniformly poor, technologically traditional, illiterate, isolated from the market and without access to the services of the State, does not always correspond to the reality of these countries (5).

The family operations materialize the ties of family and community integration in the productive process, by means of traditional practices based on the inclusion and use of the family labor force. These practices may eventually be complemented by hired labor.

Family operations are found throughout the continent, and in vast areas are dedicated to livestock production. They are characteristically an important source of supply for the domestic market and total a large number of families that depend on that activity (10). Thus, it is estimated that Ecuador

has some two million small peasant landowners who produce between 41 to 63% of ten basic foods of the family diet (15).

The number of poor persons in the agricultural scenario of Latin America has increased since 1970. According to FAO estimates, the term can be applied to two thirds of the rural population which encompasses approximately 126 million persons. CEPAL/UN studies estimate that the absolute number of poor jumped by 89 million persons from 1980 to 1989 (13).

The small producers tend to optimize their incomes and orient their production largely for their own consumption or for domestic consumption. Nevertheless, there are some minority sectors whose producers apply economic rationality, to maximize profits and can be said to be in a position to incorporate better technology.

Objectives of family production

The small livestock-production operation, organized on the family unit, facilitates a greater availability of food for the families and availability of resources insofar as it manages to increase productivity and revenue (4).

The peasant family unit is both a productive and a consumer unit. A significant part of its production is destined for self consumption and the other for exchange, so that it takes production and consumption decisions simultaneously (12).

On these farm units it is difficult to separate the domestic or "household" activities from the productive ones. In this sense, the first encompass a group of products intended for direct consumption or family consumption that meet a part of its needs, while the second, comprising the surplus after that "selfconsumption", is used for the acquisition of other goods that ensure the continuity of the productive unit.

The production unit is related to the product market through the surplus production component, and enters a commercial circuit governed by economic laws that respond to the logic of entrepreneurial economies. It also has relations

with the labor market insofar as the family workforce finds no application within the productive peasant unit and must seek employment outside it.

To understand the family unit's economic behavior, it is necessary to establish a postulate about the set of objectives it pursues and that guide its actions. Neoclassical economists have characterized the family economics as conservative and contrary to change. In reality, these economies' economic behavior is characterized by great aversion to risk, founded on the fact that they confront greater risks due to the instability of market prices and their own situation as "poor folk". That is why they diversify their production and exercise a response related to the economic stimuli. For example, when faced with lower prices for their products, they choose to increase the supply at the cost of a higher exploitation of family labor.

Due to the fact that the economic rationale of a unit emerges as response to the context in which it operates, describing it is essential to an understanding of the conditions of uncertainty that the unit faces in production and in exchange. The poor supply of resources, in both quantity and quality, leads the peasant family unit to a conduct characterized as an aversion to risk. It therefore seeks to minimize risks, choosing rather to sacrifice a small additional average revenue to the possibility of a large loss of revenue.

The risk-minimization rationale of the family unit implies that it seeks to ensure a minimal level of revenue. Given its poorness, it is in no condition to jeopardize its survival by engaging in high-risk activities.

Its production is diversified and not specialized. An empirical consequence of the postulate of aversion to risk is that the unit manages a diversified scheme of activities and, therefore, of resources.

These economies show a great weakness before the makeup of their production, which is spread out thin, atomized and diversified. They need to pass off the production quickly, even before the harvest periods, in order to continue the production cycle. To all of this may be added the almost non-existence of producers' organizations that defend their interests.

Another consequence is that the family unit's response to changes in economic incentives is not very clear, nor immediate. Under conditions of uncertainty, decisions are made on the basis of expectations. New economic incentives may change its expectations, but that will take time. Because the cycles of livestock and agricultural production are usually long, the evidence of the advantages of the incentives will have to be repeated for several years before the unit changes its expectations (5, 6).

This aversion to risk explains why the adoption of technologies generated outside the peasant economy is slow, gradual, and subject to the initial experimentation of a small group of producers. The intensity of the application and of the adaptations carried out later by larger groups will be closely related to the productivity and yield changes observed in the first small group.

This process of innovation affects the unit costs of production because the producers must incur investment expenditures during the phase of information, experimentation and adoption, investments that are found restricted by the lack of financing markets, insurance, inputs, transactions, extension services in the rural environment (5, 6). On the other hand, there are further problems related to the slowness in incorporating the innovations and to the costs thereof that confront the producers during the process of technological adoptions. The costs of experimentation and information significantly increase the unit costs of production.

Regarding technological packages, it should be underscored that in the majority of the cases they haven't been designed for these economies and actually constitute one of the major obstacles to development. So producers often ignore the arguments in favor of greater profitability, or increased revenues, or the cost/benefit relationships.

Components of family production

Upon analyzing the family productive system one can distinguish the effective components (revenue from selling production, outlay for production processes and the family's effective house-

hold expenses) to which the noneffective ones should be added, resulting basically from the production for selfconsumption and the work performed outside the family's property and activity.

These noneffective components form part of the economic strategy of this type of producer, and their valuation becomes relevant not only for their relative incidence in the overall revenue, but rather because it permits and guarantees the economic activity's continuity as such.

Peasant typologies

The existence, identification, delimitation and characterization of peasant economies in Latin America are relative to each region and economic-social space. Therefore, it is possible to find a wide range of peasant typologies as a function of their historic past, ideology and culture, of the degree of contact with the market, of their productive specialization, of their level of organization and community development, and of the availability and quality of their natural resources.

The countries that compose the Andean Subregion, for example, are linked together by multiple historic, social and geographic ties. Of notable significance in this web of interests is the Andes Cordillera, whose presence, size and vigor is diminished from south to north.

However, the Andes Cordillera, wherein the quantitative dominance of peasant forms of production has been identified, should not be taken as a geographical accident of social and economic formation, but rather as the space whose management and control developed a historically solid agrarian civilization and generated efficient and productive forms of social organization of production.

The most important sector of this Subregion is composed of small property owners who total up to more than two thirds of the rural population, in excess of 4 million families. The indigenous population occupies an important place in the population makeup, above all in Bolivia, Peru and Ecuador, where it amounts to 71, 47 and 43%, respectively (14).

On the other hand, analysis of the inner composition of the local spaces—the diversity of experiences, organizational structures (associations, communal agencies, cooperatives), access to certain services (roads, financing, technical assistance, allocation of inputs, access to credit)—reveals new difficulties in homogeneously grouping the different scales of peasant production. This all becomes more acute if one considers that an important percentage of small farms do not have the lands necessary for animal breeding, feeding and production.

In most of cases, including those where the productive factors' efficiency is considered acceptable, the small producers face limitations to reaching family subsistence levels in terms of the historical and cultural processes particular to each area.

A characteristic common to the universe of small producers is the scant availability of land usable for the production process. However, under this consideration, the peasant property's size, expressed in overall terms, becomes relative in the different regions and countries. Thus, for example, the *minifundio* is the prototype of a peasant farm located in the valleys and highlands of the Andes Cordillera in Ecuador. Vestige of the ancient *huasipungos*, it is less than 5 hectares in size. Conversely, a small property in the Amazon or tropical region of the coast is that whose size is about 50 hectares, a result of the processes of peasant migration and colonization.

Therefore, the concept of "small property", rather than defined solely according to size of the property, is related to and depends on other factors just as important as the former. Such factors include soil quality, property location, availability of irrigation, infrastructure, access to markets, etc. These factors make it all the more difficult to regionalize the peasant settlements in Latin America, based on the census data available in the countries (11).

Another acceptable, albeit possibly arbitrary proposal with which some students of the rural situation in Latin America concur, holds that small peasants could be considered those who—concomitantly with the production of agricultural goods intended for the family "food basket"—also pro-

duce animal-origin foodstuffs from a herd of less than 10 head of large livestock (cattle, sheep, pigs, camelidos) and of some smaller animals (guinea pigs, poultry) on properties less than 10 hectares in size.

CHARACTERIZATION OF THE ANIMAL-HEALTH PROFILE IN FAMILY PRODUCTION

With the restrictions arising from the preceding comments, elements of a general order are described below; they are common to the areas of: Chalatenango, El Salvador, and Ocotepeque, Honduras; Central Cordillera, Argentina and Chile; Itaguai, Brazil; and the Andean area, Ecuador. The small livestock production may be defined by its principal features, as follows:

The net revenues bound for the daily sustenance of the family members derive from the sale of products generated by the livestock-raising activity (milk, eggs, wool, poultry, guinea pigs, etc.). Occasional income is generated by the sale of larger animals or agricultural products and by temporary wages from urban activities, generally earned by the head of the family. A change in this profile has been observed in recent years, with a growing share of income earned by women. This fact accompanies the rising demand for employment of part of the intensive agribusiness in the work force.

The structure of production is characterized by the predominance of the small property, poor-quality land, small size of the bovine herd that coexists with other animal species, full and diversified use of the production (meat, milk, fertilizer, using animals as power for farm tasks, etc.), ties with the manual transformation of the production (textiles, dairy and meat products, etc.), little or no technology (mechanical, chemical, or biological), and abundant family labor. The genetic component of the livestock-raising aspect is basically a "criollo" or "mestizo" mixed breed, a rustic animal suitable for the breeding conditions and environmental characteristics.

In contrast with the limited or no investment of fixed capital, the traditional husbandry practices and unfavorable characteristics of the natural resources in which the productive process operates, peasant livestock production does possess some indicators of productive efficiency. For example, the high animal load and yields of milk and meat per surface unit. However, other indicators suggest a different behavior, such as the interval between births, age at first birth, and the production of milk per cow per day, among others.

The animal-health production profile in these economies shows critical restrictions deriving from the lack of forrage for feeding livestock. Such restrictions are overcome by free-grazing the stock for a few hours daily along local roads, ditches, ravines, gullies, streams, etc., or by the seasonal availability of products of agricultural harvests (corn husks and stalks, wheat and barley husks, sugarcane, etc.) that render the stock susceptible to problems of nutrition, deficiencies, and parasites, all of which limit the potential productive capacity. The herd management and handling conditions also facilitate a high risk of transmission of zoonotic diseases to the family nucleus (rabies, brucellosis, tuberculosis, hydatidosis, teniasis, cysticercosis, etc.), partially incorporated into primary health-attention programs.

Another of the fundamental constraints that negatively affect the animal production profiles of the peasant economies is related to the lack of infrastructure for industrialization, storage, transport, marketing, commercialization and distribution of the animal production. This situation enables the intermediary system to appropriate a significant part of the eventual monetary surpluses.

The majority of the peasant production units, however, practice suitable crop rotation and soil conservation and protection (Andean area). But peasant settlements have given way to deforestation and environmental deterioration in certain areas (Central America).

The technological supply that does exist fails, in the majority of cases, to respond adequately to the needs of the family economies. And this partially explains the resistance to their adoption.

The end-use of the human, financial and material resources generally is not assigned in an efficient manner. In most cases it is difficult to attain access to the formal channels for notification and recording of vesicular diseases and other transmissible diseases that may eventually and drastically affect the animal population.

Different problems face those family economies having the same strategic character—but a greater interaction with the market—in largely livestock-raising areas like the Salado basin of Argentina, Jaji in Venezuela's State of Merida, some regions of southern Brazil, and in Uruguay. In the largely family-production zone of Cachari, for example, one observes that:

- because animal breeding is the main commercial activity, the most important revenue is derived from the sale of calves. The so-called "off-property" revenues (not resulting from the production) come basically from the payment of retirements and work performed "off" the family unit. These may be transitory or permanent, and may or may not be related to the agricultural and livestock-raising activity;

- working for farms of entrepreneurial character is frequent. This phenomenon reflects a relationship with other production typologies that therefore result in being functional to the system. Both subsist because they are able to interact (7).

Although self-consumption constitutes an important strategy in the family economy, an aspect that merits highlighting is the downward trend it has shown in recent years. This fact reflects the growing interaction with the market and, therefore, a greater monetization of production.

From the viewpoint of the quality of the available natural resources, it is important to stress that, in the case of the family economy of the Pampas, Jaji, southern Brazil and Uruguay, no great imbalances related to entrepreneurial production are observed. This situation—infrequent in the rest of Latin America—is characterized by a progressive marginalization of this production toward the worst lands.

In general terms it may be said that these production systems are relatively sustainable, since they are maintained over time without having a

great effect on natural resources. However, their growing level of insertion into the market subjects the continuity of these economies to a serious risk. Notwithstanding those areas having an aptitude for forestry, the ongoing displacement of these peasant sectors toward zones not incorporated into production encourages the deterioration and exhaustion of the natural resources in the process of the expansion of the agricultural frontier.

The average production is above the average value of the zone, and is similar to that of other more capitalized social types. The herd on these properties comprises genetic-base stock for specific production purposes.

The animal-health profile is mainly affected by reproduction diseases and parasitosis, the latter favored by flooding and stagnant waters. The occurrence of vesicular disease is sporadic.

The low revenues preclude investments and oblige the producers to find work off their property, a phenomenon associated with depopulation and the aging of the rural population. Difficulties exist in production and commercialization owing, in part, to the faulty transportation infrastructure and limitations in access to credit, even though affected by a high fiscal load. The lack of social health coverage for the small producer is notorious.

The two areas described up to this point express the variety of problems facing the small producers in Latin America and, therefore, the diversity of lines of action to utilize in achieving an active participation by these social actors in proposals intended to improve their levels of living. These proposals should be directed from the central levels, some of them being of great need for the overall national policies, for example the Epidemiological Surveillance and Information Systems at the Human-Health and Animal-Health Levels (2).

THE SMALL PRODUCERS AND THE HEALTH AND PRODUCTION PROBLEMS

With respect to attention to animal-health problems, it may also be affirmed that the small producers selectively take up recommended technol-

ogy, with the particularity that they do so in a non-systematic manner. This makes the practice inefficient and affects the productivity of their herds.

The increase of productivity and therefore of its revenues is related in various proportions to the attention to the characteristic sanitary problems such as, those deriving from malnutrition, ectoparasites, endoparasites, brucellosis, low natality and advanced age at first birth, trichomoniasis, and leptospirosis, among the most significant. Still, it is observed that the projects implemented to date have not originated in an understanding of their specific needs, because they have not contemplated the small producers' viewpoints, especially those proposals intended to improve their present living conditions.

One of the characteristics of the technological development for the field is that the innovations are exogenous to the peasant economy. The peasants may be innovators principally in the sense of rationalizing, but not generating, their own innovations. This line of thought opens a space for trying to eliminate the dependency of the peasant economies on the innovations coming from outside, stimulating the development of their own technologies. This implies transforming the passive peasant into the main actor in the generation of innovations. Moreover, this implies modifying the present relationships among the peasantry, the extension system and agricultural research (5).

In this sense, it is understood that every community has the potential to define its problems and its needs through a mutual and reflexive learning process. And, moreover, that any action undertaken to achieve success needs the participation of all the interested sectors from the outset, that is, from the definition of the problems for preparing a diagnosis to the determination of the alternatives for solution.

The full participation of the family economy in the analysis of its own reality promotes a process of transformation for the benefit of all those involved. Therefore, "to participate" is understood as not only being informed and expressing opinions about the march of the actions, but also acquiring the right to intervene in the decision-making process.

The capability to identify problems and priorities involves the awareness of the particular conditions under which those livestock production undertakings are developed. Such awareness must rest on the perception of the real needs as established by the producers themselves. The actions should be oriented to resolving those priorities, providing a response to the problems felt by the community and enabling the process to move forward in defining the animal-health and public-health profiles.

THE SMALL PRODUCERS AND THE ANIMAL-HEALTH PROGRAMS

Any project whose objective is to improve the animal-health and public-health profiles should include the small producers' participation. Necessarily, they should establish relationships with the public and private veterinary services, in order to provide cooperation in those sensitive areas for this sector of livestock producers, through differential strategies.

The process of participation is crucial from the standpoint of the viability of the animal-health programs and, in particular, for the Hemispheric Plan for the Eradication of Foot-and-Mouth Disease (3). The Plan is presently in the phase of inclusion of the broad sectors of small producers that encompass populations, territories and livestock which, due to its importance, will be the key for a Plan that will increasingly have to rely on epidemiological surveillance and prevention.

THE SMALL PRODUCERS AND THE LOCAL VETERINARY-ATTENTION SYSTEMS

The areas wherein decentralization and community participation have had a major development are those which attained the most significant advances with respect to the animal-health goals.

For example, the implementation of the National Foot-and-Mouth Disease-Control Plan 1990-1992 in Argentina is an experience that jointly unites and mobilizes public and private sector resources. Some 350 Local Commissions have been formed in the fight against this disease, uniting approximately 266,000 producers drawn from throughout the nation. The next stage is to extend that participation among the small producers. It is therefore necessary that the animal-health programs, particularly those engaged in the fight against foot-and-mouth disease, join in a livestock development process whose point of departure is the producers' way of perceiving the problem and the solutions they suggest.

The participatory approach rests on a series of premises related to redimensioning the local space, i.e., the projection expected by a community based on identifying and providing solutions for its problems; the work of the local health service, in most cases the local veterinarian being the promoter and prop of the proposal; the speed, flexibility and agility of the diagnosis stage, and the need for an interdisciplinary group of professionals capable of furnishing techniques in accordance with the small producers' priorities, and also of detecting problems that are lines of research in their respective disciplines. Undoubtedly, a proposal of this nature requires, moreover, professionals who are in accord and harmony with its essence.

The viability of this type of participatory proposal is conditioned on the one hand by the actual participation of the producers, and on the other, by the decision and vocation of the national and international private and public institutions in promoting, conducting and financing the human and material resources required to carry out the activities appropriate for the approach undertaken.

This type of proposal is not a recent phenomenon in Latin America. Nevertheless, the long-term character implied in the development and implementation of such an approach has inhibited the attempts made to date from achieving greater repercussions owing to obstacles associated with: (a) the need for continuity over time; (b) inadequate and, in many cases, inexistent technical

proposal; (c) short-term political decisions, and (d) high mobility of the technical personnel allocated to carrying out these projects.

In this sense, these limitations should be taken into account from the outset of implementation in order to thwart their adverse effects. Although a participatory process does not guarantee perfection in capturing the reality, it does enable a more precise definition of the problems most deeply felt by the community. It also facilitates interaction, confronts reality with the theoretical interpretations, and renders more efficacious intervention by the professionals, agencies and institutions.

CONCLUSIONS

The overall problems of the small producers involve a wide variety of aspects related to land ownership, livestock production, nutrition, environmental sanitation, education, commercialization, credit, access to technical assistance, problems of technological innovation, and factors inherent in the rural communities' organizational makeup. These aspects call for a profound knowledge of that specific reality so as to identify the problems to be resolved. Among them, the definition of the priorities set by the producers becomes ineludible.

The family systems of livestock production present public-health and animal-health problems of such breadth and complexity that the systems' perception of certain livestock diseases, viewed in an isolated fashion, does not arouse their concern.

The capacity to identify the problems and priorities requires a knowledge of the particular conditions under which those livestock production activities are developed. Such knowledge should rely on the perception of the actual needs established by the producers themselves. The actions undertaken should then seek to resolve those priorities.

The attention to small producers would envisage the promotion of public health and the strengthening of epidemiological surveillance as

its central purposes. Likewise, it should take into account the great number of institutional and extra-institutional experiences that have failed because their "design" did not incorporate the true makers of the transformation: the producers themselves.

REFERENCES

1. ASTORI, D; ARRATE, C., GOYETCHE, L. *La agricultura familiar uruguaya: orígenes y situación actual*. Uruguay, Fundación de Cultura Universitaria, 1982.
2. ASTUDILLO, V.M., ROSENBERG, F.J., ZOTTELE, A., CASAS O., R. Considerações sobre a saúde animal na América Latina. *Hora Veterinária*, 9 (54): 37-43, 1990.
3. CENTRO PANAMERICANO DE FIEBRE AFTOSA. *PANAFTOSA y las prioridades políticas de la OPS para el próximo cuatrienio*. Rio de Janeiro, 1994. (In press)
4. CEPAL. *Economía campesina y agricultura empresarial*. México, Ed. Siglo, XXI, 1982.
5. FAO. *Informe alimentario mundial*. Roma, 1984.
6. FAO. *Políticas agrícolas y políticas macroeconómicas en América Latina*. Roma, 1992.
7. FIGUEROA, A. Desarrollo agrícola. En: SUNKEL, O. (Comp.). *El desarrollo desde dentro: un enfoque neoestructuralista para América Latina*. México, El Trimestre Económico, 1991.
8. FIGUEROA, A. *Educación, mercados y tecnología en la pequeña agricultura de América Latina*. Santiago de Chile, FAO/CEPAL, 1993. 62 p.
9. IRIARTE, L.; BILELLO, G. *Propuesta de desarrollo rural participativo*. Argentina, Univ. Nac. de Mar del Plata, Univ. Nac. del Centro, 1992.
10. JORDAN, F. (Comp.). *La economía campesina. crisis, reactivación y desarrollo*. San José, Costa Rica, 1989. 292p. (Investigación y desarrollo/IICA 19).
11. ORGANIZACION PANAMERICANA DE LA SALUD. *Desarrollo y fortalecimiento de los sistemas locales de salud: salud de los pueblos indígenas*. Washington, D.C., OPS/OMS, 1993. 21p. (HSS/SILOS-34)
12. ORGANIZACION PANAMERICANA DE LA SALUD. *La producción pecuaria de subsistencia. una necesidad para la salud y el bienestar de los*

- pueblos. En: *VIII Reunión Interamericana de Salud Animal a Nivel Ministerial*, Washington, D.C., OPS/OMS, 27-29 de abril de 1993.
13. ORTEGA, E. La agricultura campesina en América Latina y el deterioro del medio ambiente. En: SUNKEL, O., GLIGO, N. *Estilos de desarrollo y medio ambiente en la América Latina*. México, Fondo de Cultura Económica, 1980. p. 538-579.
 14. SERRÃO, U.M., DORA, J.F., MUZIO, F., TAMAYO, H., ZOTTELE, A., ASTUDILLO, V. Atención veterinaria local./Local veterinary attention. *Bol. Centr. Panam. Fiebre Aftosa*, 57: 60-73, 1993.
 15. TAMAYO, H. La estructura de producción como determinante de salud animal. En: LE CHAU (Ed.). *Investigación agraria y crisis*. Quito, Ecuador, Corp. Edi. Nac., 1986.

Announcement

Catalogue of publications, 1952-1993
Pan American Foot-and-Mouth Disease Center (PAHO/WHO)
Rio de Janeiro, Brasil, 1994

This document will be available in the second semester of 1994. It is a compilation of the scientific papers published by the staff of PANAFTOSA.