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POLICYBRIEF

THE TRANSITION TO NATURAL DAIRY FARMING

Towards milk production with minimal use of antibiotics and other chemicals

Building on practical solutions developed in The Netherlands, India, Ethiopia and Uganda. Saving available antibiotics for emergency cases

The urgency of solving the problem of antibiotic resistant micro-organisms

The world-wide excessive and largely uncontrolled use of antibiotics in animal production has caused antibiotic resistant microorganisms, such as MRSA (Multi Resistant Staphylococcus Aureus), Escherichia Coli and others. These multi-resistant microbes are causing severe problems:

- 25,000 human deaths per year in Europe, 23,000 in the USA. In South East Asia one child dies every 5 minutes of infections caused by resistant bacteria¹. Globally it is projected that by 2050 AMR will cause over 10 million deaths per year (more than cancer today) especially in the poorer regions of Africa and Asia.²
- Over 90% of the antibiotics given to humans and livestock ends up in the environment, affecting biodiversity, soil life and soil fertility.³
- Antibiotic resistance increases health care costs. In the US the so-called Excess Direct Health Care Costs are estimated to be US\$ 20 billion per year while the 0.4–1.6% loss in Growth Domestic Product (GDP) is estimated at US\$ 35 billion per year.⁴
- In the Netherlands the hidden costs or 'externalities' of the dairy sector, for public health, soil and groundwater pollution and climate change are estimated to be 16 Eurocent per kg of milk, 50% of the current farm gate milk price.⁵

Aim of this policy brief

With the increasing intensification of dairy farming worldwide, the use of antibiotics and other chemicals is growing. In this process the effect of excessive antibiotic use, in the form of Antibiotic/Anti-Microbial Resistance (AMR), is causing international alarm. Antibiotic resistant microorganisms are causing human deaths, as well as other burdens on human health, animal health and the environment.

This policy brief aims to provide practical solutions that address the growing use of antibiotics and other chemicals in dairy farming worldwide. The solutions provided build on the E-Motive exchange programme between veterinarians, farmers and researchers in four countries: the Netherlands, India, Ethiopia and Uganda, organized in the Natural Livestock Farming network (see box). The practical solutions provided can contribute to the action plans of local, national and international institutions such as World Health Organization (WHO), Food and Agricultural Organization (FAO) and the World Organization for Animal Health (OIE), as well as the One Health initiatives, to curb the global threat of anti-microbial resistance.

Box 1. The Natural Livestock Farming network*

The Oxfam Novib E-Motive exchange programme for dairy farming, implemented by Dutch Farm Experience for the Natural Livestock Farming network, facilitates an active exchange between dairy farmers, veterinarians and researchers in four countries: the Netherlands, India, Ethiopia and Uganda. Stakeholders of the programme base their experience on 30 years of cooperation. Practical solutions and local knowledge is collected, assessed and promoted on a participatory bases, to provide solutions that have been 'proven by practice' and are low in costs and relatively easily accessible.

*www.naturallivestockfarming.com



Box 2: One Health Approach

The activities of the Natural Livestock Farming network are in line with international policies such as the Global One Health Approach, endorsed by the World Health Organization, the European Union, the World Organization for Animal Health, and the United States Centres for Diseases Control and Prevention.⁴ The three basic elements of this approach are (1) recognition of the inter-dependence of human, animal and environmental health; (2) One Health is a major component of food security and safety; and (3) disciplines such as economics and social sciences are included.

In this approach the prevention of (infectious) diseases and antibiotic use is promoted as well as new technologies, such as phage therapy⁶, new types of antibiotics and worldwide monitoring of human and animal health. The Dutch Government, for example, formulated an integrated action plan to reduce antibiotic use with three Ministries; Public Health, Economic Affairs (including Food and Agriculture) and Infrastructure and Environment.⁷

Solutions from practice

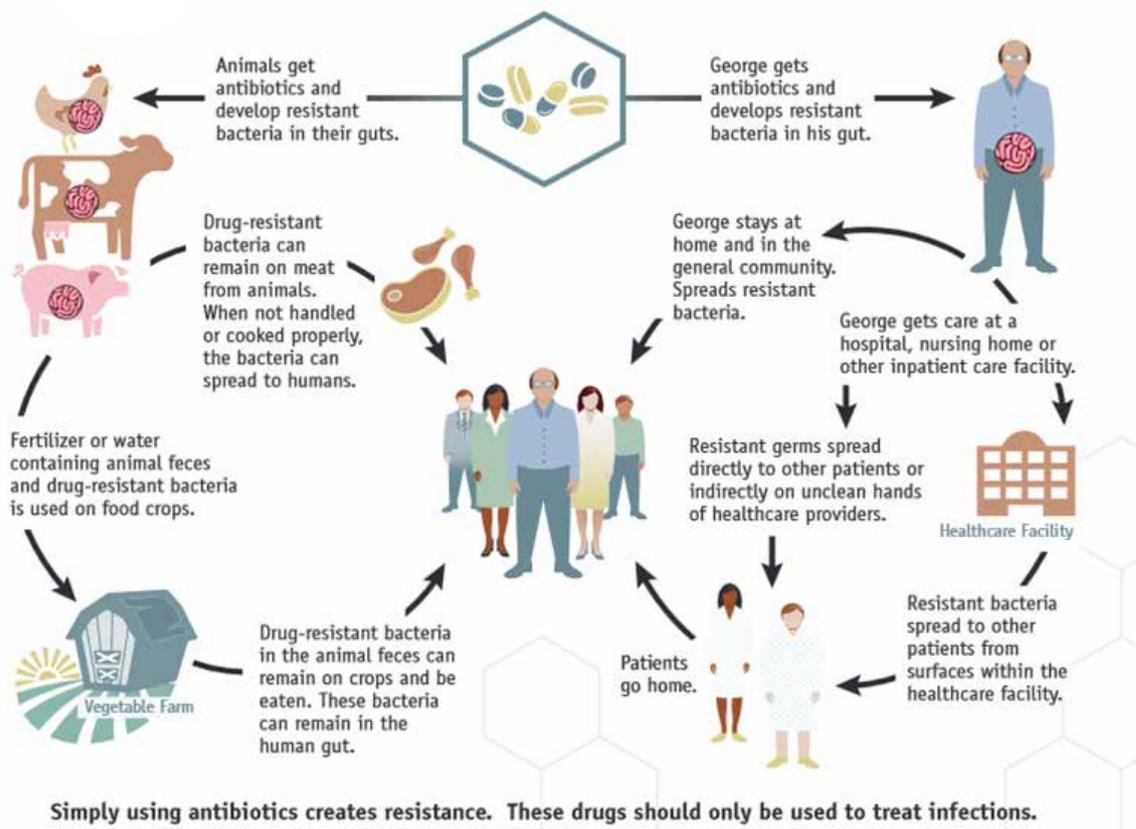
Since the Natural Livestock Farming programme is based on the expertise of farmers, veterinarians, dairy factory managers, university teachers and researchers from different cultural backgrounds, we have been able to collect and develop practice-proven alternatives to reduce antimicrobial resistance. These strategies can supplement and strengthen the strategies of large (inter) national organizations. We, therefore, recommend the following activities to be included in anti-microbial resistance action plans:

a. Document and assess ethno-veterinary practices

Ethno-veterinary practices (EVP) include herbal medicine as well other locally adapted practices in animal health care. In India, TDU (Trans-Disciplinary University) together with TANUVAS (Tamil Nadu Veterinary Science University) have documented, assessed and promoted locally available herbal medicine on basis of Ayurvedic principles. Together these institutes now provide training courses for farmers and veterinarians (included Post-Graduate diploma course) from the three main milk unions in the South-Indian states Karnataka, Kerala and Tamil Nadu. The training focuses on preventing and curing the most common cattle diseases with herbal medicine. The control of mastitis, for example, is based on an age-old recipe with Aloe Vera, kurkuma and calciumhydroxide.

In the Netherlands as well as in African countries such as Ethiopia²⁰ and Uganda ethno-veterinary practices have not been so intensely investigated, but they do provide a rich local resource for natural animal health practices. In the Netherlands the use of natural products is on the rise. NVF and RIKILT have developed Stable Books indicating the herbal medicines available for dairy-, pig-, chicken and calf rearing⁸. Today 40 % of Dutch dairy farmers are using one or more herbal products, the most popular being mint cream (*Mentha arvensis*) used where there are symptoms of a high cell count and beginning mastitis.

In the Natural Livestock Farming network joint efforts are being developed to assess - under different circumstances - these ethno-veterinary practices,



Source: <http://edition.cnn.com/2015/03/27/healthobama-antibiotic-resistance/>

and to market herbal products on basis of community-enterprise. The Indian institutes are currently supporting the Dutch and African partner institutes that are documenting and assessing plant-based resources in the Netherlands, Ethiopia and Uganda. This collaboration between the four countries has also lead to new scientific research aimed at proving the effectiveness of traditional methods – including the Indian method of Reversed Pharmacognosy.⁹

Box 3: Anti-microbial impact of herbs

The use of herbs is as old as livestock farming. In British Columbia, Canada 128 local herbs have been identified which farmers use to prevent and cure animal diseases, including *Achillea millefolium*, *Arctium lappa*, *Salix alba*, *Teucrium scorodonia* and *Galium aparine* used to treat mastitis¹⁰. Essential oils from the leaves of *Eucalyptus globulus* and *Thymus vulgaris* work antimicrobially against *Escheria coli* and *Staphylococcus aureus* (MRSA)^{11, 12}. Garlic, *Allium sativum*, has a high potential to combat mastitis and MRSA¹³. In the Amhara region in Ethiopia a multi-flora honey proved to be highly efficient in controlling MRSA-bacteria in vitro.¹⁴ Scientific research to provide evidence of how these alternative medicines work is just beginning. But farmers are not waiting for scientific proof; they have evidence derived from practical results.

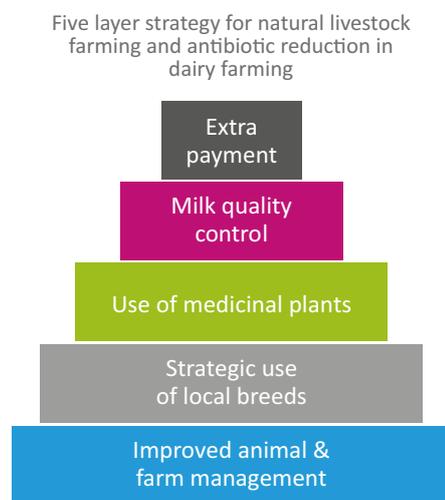
b. Collect the practices of dairy farmers

All over the world there are farmers who produce milk with little or no chemicals – and much can be learnt from them. For example, it is estimated that in The Netherlands around 100 dairy farmers (organic and conventional) produce milk without using curative medicines like antibiotics and anthelmintic. All this begins with optimal animal and farm management including soil treatment and manure management as well as animal feeding, breeding, grazing, housing, milk management and other forms of disease prevention. In scientific terms this can be termed agro-ecological

farming. There are always successful farmers who know how to optimize ecological, social, cultural and economic conditions (see Box 4). Other dairy farmers can learn from them. Many influential development experts like Vandana Shiva¹⁵, Miguel Altieri¹⁶, Pablo Tittone¹⁷, Stephen Gliessman¹⁸ and Olivier de Schutter¹⁹ support this agro-ecological approach.

c. Participatory learning and research networks

To achieve a reduction in the use of antibiotics and other chemicals in dairy farming, groups of farmers, veterinarians, researchers and dairy industries are working together in participatory learning and research networks. These learning and research networks are strengthening dairy sector initiatives in the countries involved – moreover they are developing joint activities within the international NLF network. (for an overview, see Box 5)



The results of the exchanges within the network clearly indicate that the road-map towards antibiotic-reduced and antibiotic-free dairy farming has five levels: (1) optimal animal management, adapted to local circumstances, (2) strategic use of local breeds (3) use of herbal medicine, (4) effective milk quality control, and (5) extra payment for high quality (and residue-free) milk.



Box 4: Antibiotic free price-winning cheese producers

Since 2004, Dutch dairy farmer Jan Dirk van der Voort produces milk without any antibiotics, de-wormer or vaccination. Jan Dirk: ‘Together with my wife Irene it took me years to develop a well-balanced system. I started by observing everything on the farm, including myself. I studied the consistency of manure in relation to feed; the impact of maize on the fertility of cows; how worms in the soil reacted to straw manure. All the diverse elements of farm life acted as a mirror. Horns act as mineral depots. Horned animals give butter of

a higher quality than dehorned cows. Herbs and fruits with stone-seeds can replace mineral supplements and so on! By looking deeply in all these mirrors I learned how all these elements are related and how to build a system-in-balance. The health and fertility of my cows has improved and the organic matter content and number of worms in the soil has increased. I have also changed: I feel more self-assured and part of nature. If you are able to study nature and open yourself to how nature works, you are capable of building a farm that is really sustainable’. Jan Dirk receives numerous researchers, policy makers, students and farmers on his farm and his cheese has won several prizes. It is even available in New York! www.remeker.nl

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Box 5: Natural Livestock Farming initiatives in Netherlands, India, Ethiopia and Uganda

The Netherlands:

- Developing herbal recipes for mastitis prevention in cows and diarrhoea prevention in calves
- Developing post-graduate diploma courses on herbal medicine for Dutch veterinarians combining Indian and Dutch knowledge
- Developing dairy farming strategies with low – and zero – antibiotic use
- Strengthening breeding expertise of local breeds for example Frisian cows

India:

- Community-based enterprise development for producing herbal medicines
- Organic dairy chain development with dairy companies
- Post-graduate diploma courses on the use of medicinal plants and ethno-veterinary medicine

Ethiopia:

- Community-based cattle breeding programmes;
- Strengthening animal management strategies for dairy systems based on local breed and cross-breed cattle
- Documenting and assessing ethno-veterinary practices

Uganda:

- Community-based Ankole breed conservation, including marketing of niche products
- Documenting and assessing ethno-veterinary practices

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