REPORT OF KENYA DAIRY TRADE MISSION TO THE NETHERLANDS AND INTERRACTION WITH DUTCH DAIRY DEVELOPMENT PARTNERS




COMPILED BY ANTON JANSEN, PATRICK MUDAVADI AND DAVID MAINA

12TH – 19TH AUGUST 2013

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INTRODUCTION

SNV Kenya is implementing the Kenya Market-led Dairy Programme (KMDP). This is a 4.5 year programme funded by the Embassy of the Kingdom of the Netherlands, which took of 1st of July 2013. The overall goal of KMDP is to contribute to the development of a vibrant dairy sector with beneficiaries across the value chain, which is private sector driven. KMDP works with all relevant value chain actors to enhance growth and efficiency to increase production, income of employment, lower cost price of milk and increase milk quality. KMDP has two pillars also termed project objectives:

Objective 1: Increase efficiency, effectiveness and inclusiveness of the dairy value chain

Under this objective, the project will work in milk sheds, with processors and farmers' Collection and Bulking Enterprises (CBEs), willing to invest in extension, improved input and service provision, milk quality and building strong mutual business relations by honouring milk supply contracts. KMDP will also work with input suppliers and service providers with an aim to promote inclusiveness and sustainability.

Objective 2: Promote innovations that address systemic issues in the sector

Under this objective SNV support private sector to innovate and adopt international best practice in breeding, feeding, farm management, milk handling & logistics, milk processing & marketing, and training. One of the activities under this pillar is to organise exposure visits to international dairy market, and by doing so help Kenyan and international stakeholders (input, service, knowledge providers and investors) to establish business linkages and other forms of support that lead to transfer of knowledge and technology.

Hence SNV Kenya is a member of the East Africa Dutch Dairy Development Partners platform http://www.nabc.nl/Services/StrategicSectors/Dairy(KenyaUganda).aspx.
The DDDP platform is a joint initiative of the Dutch Minister of Development Cooperation and stakeholders in the Dutch dairy sector, who have an interest and ambition to penetrate the East African dairy market with their products and services, and to develop structural business relations. The initiative is carried out as part of the 2g@there programme that is administered by Agency NL and coordinated by NABC (Netherlands Africa Business Council http://www.nabc.nl). See Annex 1 for the membership and profiles of the individual members of the DDDP and NABC.

Activities of the East Africa Dutch Dairy Platform include incoming and outgoing trade missions, matchmaking activities, and setting up pilot projects (demonstration/training-farm). During all these activities the Dutch consortium members will be working in tandem with local partners. This also includes SNV and Agriterra as Dutch NGOs with an office and a dairy support program in Kenya. The 2g@there programme dairy involves both a business and a sector component (government policies, industry associations etc.).

The Kenya dairy sector is dynamic and in a growth phase with many farmers, input suppliers and service providers, cooperatives and private milk processors willing and able to invest. However there is lack of knowledge of international best practice across the value

chain, but at the same time great willingness to learn, get exposed and establish international (business) linkages.

In view of this and the joint objectives of KMDP and the Dutch Dairy Development Partners (DDDP), NABC, SNV and Agriterra decided to organise and facilitate a Kenya Dairy Sector Mission to the Netherlands from 12 – 19 August 2013.

A total of 40 participants (SNV "clients" and 4 SNV staff) subscribed from across the value chain: smallholder farmers cooperatives, large scale commercial dairy farmers, commercial fodder producers, financial institutions, dairy processors, County Governments, training institutions, the Ministry of Livestock, Kenya Dairy Processors Association and Kenya Dairy Board. See Annex 2 and 3 for the invitation letter from NABC and the list of participants.

The Mission program (Annex 3) was developed in close cooperation between SNV, Agriterra and NABC, that also took care of transport and other logistics in the Netherlands. Financial contributions from participants amounted to over 60% of the total costs.

This report gives in the following chapters a brief summary of the proceedings of the outgoing Mission.

OBJECTIVES OF THE MISSION

- Expose the Kenya mission comprising different dairy value chain stakeholders from the Kenya dairy sector to the highly developed Dutch dairy sector.
- Promote and facilitate interaction between the Kenya mission and the Dutch Dairy Development Partners for identification of concrete business opportunities through round table sessions, incoming and outgoing trade missions, matchmaking – business to business – sessions and setting up pilot projects.
- Promote knowledge exchange and learning (training, education, research) from the Dutch Dairy Development consortium members in order to further optimize the Kenyan dairy sector.

DAY ONE: TUESDAY 13TH AUGUST 2013: TRAINING, EDUCATION, CAMPUS AND THE DUTCH DAIRY DEVELOPMENT PARTHERS

3.1 PRACTICAL DAIRY TRAINING CENTRE (PTC+): *MR. ARJEN HEEREMA (DIRECTOR)*

Located in Oenkerk, Leeuwarden, PTC+ (learning by doing) is a leading, highly innovative practical training centre. PTC+ was started 60 years ago and its expertize centres include: Rural Environmental Development and Animal Husbandry; Refrigeration; Dairy Farming and Milk Processing; Engineering Technology; Pig, Poultry and Animal Feed; and Cooperative Development. The shareholders of PTC+ comprise farmer's associations, other educational institutions and Ministry of Agriculture. PTC+ is also part of the Aeres Group of Education, with other members being Vilentium and Groenhorst college.

At PTC+, the training programs are demand driven, aiming at meeting the real needs of the participants. In this case, participants learn and acquire skills that they put into their own practice or back-home situations. Target for training comprise: farmers, farm managers, extensionists and sales managers, technicians and operators, students and agricultural trainers.

The trade mission was informed that from September 2013, PTC+ will become the Dairy Training Centre, DTC (Oenkerk/Dairy Campus). PTC+ has 70 expert trainers (and freelancers) that offer expertize training of the whole (agricultural) supply chain (input supply, primary production, processing, distribution and retail). The training programs and courses offered at the Expertise Centre Dairy Farming and Milk Processing at Oenkerk, include

- Feed and fodder production and management
- Fertility management and Artificial insemination (AI)
- Cow comfort including hoof care
- Milking systems and advanced technology/techniques (i.e. high tech milking robots)
- Value addition in dairy chains
- HACCP and Quality management in milk processing plants

Figure 1: Mr. A. Heerema training participants in PTC+ hall

Figure 2: Participants tour the PTC+ training farm

The Training Centre's farm in Oenkerk is privately owned since 2012. The farm size is 130 hectares (ha), and there are 180 milking cows producing 10000kg/year with 4.23% fat and 3.45 protein. There are three (3) milking robots by Lely and two (2) fulltime employees.

It is important to note that PTC+ also offers consultancy and advisory services on a variety of agricultural projects in 70 countries worldwide. Current projects include: (1) 2g@there program in Kenya and Uganda, (2) Greendeal Coffee project in Uganda, and (3) Livestock Expertise Centre in Russia.

3.2 DAIRY CAMPUS AND DAIRY TRAINING CENTRE: CENTRE FOR INNOVATION, EDUCATION AND RESEARCH FOR THE DUTCH DAIRY SECTOR

Mr. Kees de Koning – Director, Dairy Campus

The Dutch dairy sector is changing rapidly in terms of sustainability, animal welfare, tracking and traceability, quality control, entrepreneurship and profitability. The Dairy Campus offers an opportunity for understanding future Dutch dairy systems and incorporating new knowledge into the dairy sector. The Dairy Campus is therefore a national catalyst place for inspiration, innovation and dynamic development for the dairy sector.

The Dairy Campus is financially supported by Province of Friesland and City of Leeuwarden. The Dairy Campus is also supported by several organizations that include; Wageningen UR, Wageningen UR Livestock Research, Van Hall Larenstein and AOC Friesland (education) and the farmers organization LTO.

The Dairy Campus integrates research with education and knowledge dissemination in order to initiate innovations in the Dutch dairy sector. This is done in close connection with dairy farmers and enterprise in agricultural business including supply and processing industry.

Activities of the Dairy Campus

Dairy Campus is the (inter)national platform where entrepreneurship, innovation, research and education are combined in order to facilitate an innovative entrepreneurial development of the Dutch dairy sector. Specific activities for the Dairy Campus comprise:

- National dairy centre for development agribusiness dairy chain
- Research: sustainable innovations (people, planet, profit)
- Entrepreneurs: dairy farmers, supply and processing industry
- Education/training: innovations and dissemination through agricultural education and learning programs including BSc and Master degrees
- Economic enforcement of the dairy sector by transferring innovations to education, training and transition programs.

Five Pillars of Dairy Campus

Research, Innovation, Education, Training and Knowledge transfer

The trade mission was informed that the Dairy Campus besides being a virtual centre, plans are developed to build a complete infrastructure with a research farm, education training and dissemination facilities, where researchers, teachers, students, farmers and business representatives can meet, work together and share expertize and knowledge.

Figure3: Participants view a huge manure processing and biogas plant at the Dairy

Figure 4: Grass silage in bales of 500kg wrapped in polythene for storage at Dairy Campus

3.3 MEETING WITH DAIRY DEVELOPMENT PARTNERS AND OTHER STAKEHOLDERS IN THE DUCTH DAIRY SECTOR

While at the Dairy Campus, the trade mission from Kenya interacted with, and received presentations from the Dutch Dairy Development Partners and other stakeholders in the Dutch dairy sector. The climax of this interaction was a colourful boat tour and dinner with the Dutch Dairy Development Partners.

Dutch Dairy Development Partners is a consortium with a comprehensive programme focusing at the total dairy value chain, a "one stop shop" for everything involving dairy. The programme is supported by Agency NL, part of the Dutch government, with major input of the Dutch members. Activities carried out by consortium members include: research into the demand for dairy and capacity needs assessment for local producers and processors; round table discussions, incoming and outgoing trade missions; matchmaking activities; and the implementation of pilot projects (demonstration/training).

Figure 5: Roundtable discussions between DDD partners and the Kenya trade mission

Figure 6: Kenya trade mission boat tour and dinner with DDD Partners

DAY TWO: WEDNESDAY 14TH AUGUST 2013: MILK PROCESSING/COOPERATIVES, HOUSING AND COMMERCIAL DAIRY FARMS

4.1 DAIRY FARM: VAN WEPEREN FAMILY IN OOSTERWOLDE

The commercial dairy family farm was located in Oosterwolde, Leeuwarden. Jan was the fourth generation farmer and took over the farm at 35 years. Then the farm was 50 Ha with 80 dairy cows producing 5,000kgs milk per day, but is now expanded to 218 Ha with 480 dairy cows producing 30,000kg milk per day. The average lactation yield per cow is 9,700kgs. The farm has a yearly milk quota with Friesland Campina of 4.5 million kgs.

Labour: The labour force was 8 persons, inclusive of the farmer and his brother Klaas. The two are however part time, as Jan also lectures at an agricultural institute and his brother a construction supervisor.

Feeds and Feeding: The farmer had 80 Ha on natural grass (English Rye grass), 70 Ha of maize for silage and 20 Ha for Hemp. The feed ration (TMR) comprises 1/3 corn (maize) silage, 2/3 grass silage and 800gms Hemp straw per animal per day. Production on this ration is 20-22 kgs per cow per day. The cows are also challenge fed with concentrates (from South America) and minerals depending on production. Grass silage is from the natural English rye grass, harvested at 30 cm with 30-40% dry matter (DM). The grass has 16-18% crude protein at below 30 cm. The cows require at least 16-17% crude protein. For the maize silage, compaction is vital. The farmer purchased a feed mixer for EUR 160,000.
Feeding depends on the state of the cows. Dry and pregnant cows (up to 40-45 days before calving) are fed on low quality maize silage, grass silage and high-fibre hay/straw to provide low energy, enough protein and high roughage. Lactating cows are fed high quality maize and grass silage and supplemented with concentrates and minerals.

Calf Rearing: Male calves are fed on colostrum for ten (10) days. Female calves are fed colostrum for 2 days, and then milk replacer for 75 days to attain 35-38kgs. They are also fed hay and ad lib concentrates. Calves attain growth rate of 1 kg LW per day.

Breeding Objective: The farm has an 8 year breeding focus aiming at robust, durable dairy cows that produce milk easily. The breeding objectives comprise:

- Increase in production potential
- Replacement rate – 28% (ideal is 20%)
- Conformation – feet and legs
- Longevity (durability) – average cow age is 5-6 years with 3-4 lactations. Lifespan production per cow is 30,000 kgs milk.
- Health and fertility – culling
- Attractiveness
- Milk – lower fat and raise protein

The farm undertakes genomic selection and in-sire bulls with semen from CRV. The Cost of semen is 7.5 Euros per straw.

4.2 DAIRY FARM AND CHEESE MAKER: JOHAN BERGSMA NIJENSLEEK

The farm was located on 50 Ha land and has 50 dairy cows with young stock. The breeds are pure Holstein and pure Fleckvieh/German Simmental. The animals were fed good quality feeds, with a TMR feeding program designed by Henk who is the nutritionist of Wielink Agricultral Trading Company. Wielink is an agricultural contractor that specializes in preparing TMR for farmers. The feeding regime (Total Nixed Ration, TMR) comprised:

- 50% grass silage from Italian Rye grass
- 50% maize silage (soya bean or corn), depending on cost of milk production
- Concentrates given based on productivity. For example, for cows producing 50 kgs milk per day, are given 8 kgs concentrate extra per day.
- The cows consume up to 26 kgs per cow per day.

The TMR is formulated based on productivity, fertility and veterinary costs. Milk from the cows is mostly utilized by the wife, who specialized in cheese making, and had cheeses of various flavours and ages.

Figure 7: Hilde from NABC cutting Bergsma's cottage cheese

Figure 8: Various types of cheeses on display

4.3 FARM MECHANISATION: GEBR KNOLL IN ROUVEEN

Gebr. Knoll is a family business, with more than 50 years of knowledge and experience in agricultural and garden machinery business. The company is located in picturesque village Rouveen situated between Meppel and Zwolle in Overijssel.
They are official dealers for Massey Ferguson, for a wide range of tractors and machinery for agricultural and horticultural sectors. The also supply machinery from Kuhn, Fella, Trioliet and McHale. Gebr Knoll also specializes in supply of balers and wrappers from Agronic and Tawi.

The Kenya mission was taken through a demonstration on baling and wrapping. The AGRONIC MR 820 MultiBaler 85-90 is a small baler-wrapper combination with high capacity for making round bales. This is the ideal way of compacting and ensiling different sort of materials like maize, sugarbeet pulp, chopped grass and straw and other organic fibre products. The round bales have a fixed width of 85 cm. and the diameter can vary from 85 till 90 cm. The bale weight

for instance in maize will vary from 350 till 500 kg depending on the dry matter. The machine does between 40-50 bales per hour. It requires low horsepower, so it can be operated by a tractor low as 70 hp.

Figure 9: Demonstration by Knoll on baling and wrapping

Figure 10: Baling and wrapping demonstration

4.4. ON-FARM CHEESE MAKING IN KOUDUM

The farm, visited on this day undertakes cheese making from the milk produced in the farm. The farm is located in Koudum. What was striking about the farm is the ownership structure, where the current owner bought off the parents and his brother to gain full control (this is unlike Kenyan setup where property, including land, inheritance is almost an absolute right).

Lely Discovery robot cleaning the floor above and below, Lely Juno robot pushing roughages into place

The farm has a total herd of 300 cows and was producing 4000 liters of milk per day from 145 cows (with an average annual of one million liters).

The farm stands on 115 hectares of land, with 15Ha planted with maize for silage. The farm relies mainly on grass silage. Some of the farm machineries used in the farm are sourced from those who undertake contract farming (in this case, the owner's brother). Due to labour costs,

the farm is highly mechanized including cleaning of the cow barn and pushing roughages into place. The farm processes 4,000 liters of milk per day into cheese. The cheese is sold to via the shop at the farm while others are sold through supermarket chains which have entered into supply contract.

4.5. COWHOUSE INTERNATIONAL

Founded in 2001 Cowhouse International BV designs and builds cowshed structures and provides consultancy services. It is manned by 7 fulltime staffmembers with different back-grounds. Cowhouse advices its customers on cow comfort, produce cow mattresses and organize training academies to help spread knowledge to up-coming young farmers. CH collaborates with universities and other training institutions in undertaking research so as to come up with products grounded on sound knowledge and facts. As explained by Tabe Bruinsma (Sales Manager), a dairy cow's time should be utilized as follows:

- 20% spent on eating
- 60% on laying/resting
- 16% on others (milking, walking, ect)
- 4% socializing

With a cow laying down for about 14 hours per day, blood circulation is enhanced by more than 40% thus more milk (and that a cow should lay down by 60 seconds after walk-in into the sleeping area). Failure to observe this is an indicator of discomfort of the cowshed. A high-yielding cow should not walk more than 70m per day. In terms of barns, his advice was that a double-row barns in the inside and single-row at the outside is cheaper (averaging 60 Euros/head when fully done).

Of notable advice he gave was that it is not advisable to use rubber mats in Kenya as it emits a lot of heat making the cow uncomfortable (he recommended the use of sand or straws).

4.6. BLES DAIRIES

Bles Dairies is a family-run dairy cow export business established in 1990. They exclusively deal in the export of heifers (they do not produce milk for sale, as they have not been awarded a milk quota). They buy calves from farmers at an average price of 400 Euros each. The calves, upon arriving at the Bles farm, are kept in isolation pens where they are monitored for any

symptoms of disease for 21 days after which they are taken through different stages of growth management. They export 6,000 to 10,000 heifers every year to different parts of the world including Africa. As at the time of visit, the farm had 600 head in total. They also have a quarantine ranch in Denmark where they also undertake breeding. They deal mainly in Friesian Holstein heifers.

They have partnered with The Friesian in providing advice to their clients/farmers across the world. They also deal with semen and embryo sale through the brand Semex.
The average cost of keeping a heifer till it is ready for sale, according to Mr. Henk Bles, is 1,500 Euros (this is a heifer of about 21 to 23 months old and pregnant).

DAY THREE: THURSDAY 15TH AUGUST 2013: FEED, FODDER, MECHANISATION AND BREEDING/SELECTION

5.1 DAIRY FARM: SCHEP HOLSTEINS – FRIESLAND

The company has three dairy farms with 450 dairy cows and 200 young stock. The farms are 280 Ha with 70% allocated to grass and 30% to yellow maize. There are 6 employees and feeding/milking robot from Lely. The feeding regime is semi total mixed ration.

The TMR comprises sugar beet peels, maize silage, wheat bran, soya meal and rape seed, sprinkled with molasses and minerals. The roughage quality of the feed was excellent. The cows receive between on average 24kgs DM, but super cows could eat up to 40kgs dry matter (DM) per day depending on state and productivity. Lactating cows are also given 3-4kgs of concentrate at milking.

The farm adds 1,2-Propandiol to increase the roughage intake for the dry cows. Cow beddings are manure, treated and processed (dried) on the farm.

Figure 11: Manure processing machine at Schep Holstein

Figure 12: Young stock rearing at Schep Holstein

Average lactation milk yield on the farm is 11, 212kgs with 3.92% fat and 3.48% protein. Daily milk yield ranges between 36-70kgs per cow per day. The yearly output for the farm is 8.5 million kgs with a net revenue of 2.93 million Euros. Under Farmel Dairy Livestock (www.farmel.nl and info@farmel.nl), the company mediates internationally at the purchase and sale of heifers, cows, young stock and complete herds.

5.2 FEED MANUFACTURER: AGRIFIRM FEED FACTORY IN ZWOLLE

Agrifirm is a cooperative firm with 17,000 members in the Netherlands. The firm has seven mills in Netherlands, 2 produce dairy feed, 2 produce chicken feed, 2 produce pig feed and 1 produce biological feed. The factories produce 2.3 million tons per year. All the feed is consumed in Holland. The factory the Kenyan mission visited in Zwolle was producing pig feed.

90-95% of raw materials for the feeds industry like soy, barley, yellow maize, rapeseed are imported from all over the world. This factory produced concentrates in the composition required by the client. In the Dutch pig industry rations at farm level are composed of concentrates bought from the feed manufacturer, and up to 50% of by-products from the agro-industry supplied by fodder traders (e.g. potato starch, whey, sugar beet pulp, brewers waste and the like). Both the supply chain of concentrates and by-products are GMP+/HACCP certified. The Dutch animal feed concentrates and by-products industry complies with stringent QC/QA systems and protocols with tracking and tracing from seed to feed and from grass to glass.

The fully automated production process at Agrifirm Zwolle comprises: proportioning/weighing, grinding, mixing, expanding/ pressing, cooling, coating fat and enzymes and loading. 10,000 tons of pig feed is manufactured per day. The factory has 25 laborers and 25 truck drivers.

5.3 BREEDING, SELECTION AND ARTIFICIAL INSEMINATION (AI) SERVICES, CRV ARNHEM - BREEDING FOR PROFIT BY KAREL FENTSAHM

CRV is a leading cattle breed improvement organization with offices in several parts of the world and 2,000 employees worldwide. In Kenya CRV collaborates with Coopers. CRV is a cooperative owned by Dutch farmers and run by professionals. Artificial insemination (AI) started in Netherlands in 1938 and in 1943 the milk recording centre (Centrale Melkcontrole Dienst) was established.

The breeding statistics of the Netherlands dairy sector comprise:

- Number of dairy herd 19,028
- Herd under milk recording 16,173 (85.0%)
- Number of dairy cows 1,469,720 92/3/ B&W and 1/3 R&W)
- Cows in milk recording 1,293,375 (88.6%)
- Average number of cows 77.2%

- Total inseminations by CRV 71%
- Identification and Recording (I&R) 100%

CRV Products comprise:

- Dairy semen
- Beef semen
- Genomic selected semen
- Sexed semen
- Consultancy

CRV Management Products comprise:

- Fertility plan – cow attention list
- Registration card
- Export certificate
- Milk recording report
- Type classification report
- Sire advice programme
- Innovation, research and training

CRV Breeding Objective:

A healthy and long lasting cow which delivers an optimal contribution to farm profits through efficient production, functional type and excellent functional traits. To achieve the goal set for the breeding program. CRV in the Netherlands operates two separate breeding programs: Delta and Euro Donor.

DAY FOUR: FRIDAY 16TH AUGUST 2013: FODDER, MILK PROCESSING AND THE DUTCH DAIRY SECTOR

6.1 DUTCH DAIRY BOARD, NZO/LTO – MR SIEM JAN SCHENK

Dutch Product Boards

In 1948 the Dutch government approved the Act on Public Law Organisations, which are comparable to the system of Product or Commodity Boards in other countries. A Public Law Organisation is an association of producers and entrepreneurs in the same production or value chain, which are involved in the creation of the same end-product (from raw material to end product). Commodity Boards have a broader scope and membership than industry or trade associations (for a definition see chapter 4 below), for example it would typically have representatives in the board or governing council from various industry associations (e.g. dairy farmers associations, processor associations, feed manufacturing associations, breeders association, workers unions and representatives from relevant government departments.

The Commodity Boards played a crucial role in governing and developing the many agricultural sub-sectors in the Netherlands. The main objective of the creation of these Commodity Boards was to allow private sector stakeholders operating in the same product chain, to establish a policy lobbying platform and be part of policy development, to delegate implementation of government policy and regulatory framework, to introduce self-control mechanisms and introduction of voluntary standards and codes of conduct, to set up training and research for the sector, and to promote all other interests deemed necessary for the proper governance and development of the sector.

In 1960 there the Netherlands had almost 50 Public Law Organisations or Commodity Boards, most of them in the agricultural sector. Important for the dairy sector are the Dutch Dairy Board ("Productschap Zuivel") and the Animal Feed Board ("Productschap Diervoeder").

These Commodity Boards:

- Have a mandatory membership from stakeholders across the sector including representatives of government departments;
- Can put out binding conditions to their members;
- Collect levies and cess from their members for financing part of the Boards activities;
- Receive government funding for implementation of both public and autonomous tasks.

The Boards have two main sets of tasks:

- Governmental tasks: execution of governmental tasks at request of the government (usually Ministry of Agriculture and Livestock), and
- Autonomous tasks: execution of autonomous tasks for the development and competitiveness of the sector.

In Netherlands, there are over 20 different Product or Commodity Boards in different sectors that regulate the sector in a partnership model that includes all stakeholders in a particular value chain, including Government.

The Dutch Dairy Board played a crucial role in developing and implementing a long term vision, policies, strategies and dairy standards and regulation for transitioning the dairy industry from growth to maturity and bringing structure and sanity in the sector. As the Netherlands is a large exporter of dairy products milk/product quality, cost price, animal health, education and training, and innovation & research have always been crucial pillars of sector gvernance and development by the Dairy Board that receives central government funding and mandatory levies from the private sector.

With a growing maturity, integration and consolidation in the sector, the Dutch government is now retreating from the Dairy Board. The Board's functions are largely to be taken over by the

private sector through self-regulation and control by LTO Nederland, the Dutch Farmers Federation for Agriculture and Horticulture.

The Dutch dairy sector experienced a tremendous restructuring over the last 60 years. This is exemplified in the table below:

a). Characteristics of the dairy sector in the Netherlands during 1950-1980.

Year	Number of dairy farms	Number of cows x1000	Milk-Production Litre x1000	Fodder Grassland x1000ha	Maize x1000ha	Clover x1000ha
1950	216,000	1,518	4,766	1,317	-	24
1960	200,000	1,628	6,068	1,327	-	10
1970	131,000	1,896	7,748	1,334	6	6
1980	87,000	2,356	11,510	1,198	139	2

b). Effect of introducing milk quota by the EU and other structural adjustments 1990-2010.

Year	Number of dairy farms	Number of cows x1000	Milk-Production Litre x1000	Fodder Grassland x1000ha	Maize x1000ha	Clover x1000ha
1990	65,000	1,878	10,766	1,096	202	6
2000	30,000	1,504	10,734	1,010	205	7
2010	17,500	1,479	11,626	951	231	6

This restructuring was characterized by a sharp decrease in number of farms paralleled by a sharp increase in number of cows per farm and milk production per animal. This becomes very clear from the highlighted sections in the table above.

The opportunities for the tremendous growth of the Dutch dairy sector comprise:

- Favourable climate
- Presence of strong cooperatives in milk processing and value added products (FrieslandCampina), delivering AI and breeding services (CRV), feed manufacturing (Agrifirm), fiannce and insurance (Rabobank) and so on
- Excellent financing systems in place
- Advanced infrastructure and logisitcs
- Assured feed quality and standards
- Highly developed forage sector (energy and protein rich maize and grass)
- More than half (50%) of the products exported, with an opportunity for good prices in China
- The European Union (EU) imposed the milk quota system in 1983, which is ended now and hence an opportunity for entrepreneurs to increase production for export.

In The Netherlands, annual membership fee of the Farmers Union (LTO) is between 700-800 Euros, while levies and retributions paid to the Dutch Dairy Board is 500-600 Euros, depending on farm productivity.

6.2 FRIESLAND CAMPINA: THE MAASDAM FACTORY

The factory processes 600,000 kgs of milk per day to make over 110 different dairy products that are not limited to:

- Flavored milk and drink yoghurt types, some with as low as 0% fat to 10% fat
- Special yoghurts
- Custards and deserts

The factory had 200 staff that works in 3 shifts 6 days a week, with most operations fully undertaken by robots. Although the daily intake of milk is 600,000 liters the Mission Team did not see any milk as the entire process is in a closed system from the cow to the retailer: milking machine/robot – milk chilling tank – transport in tankers – storage and processing at the factory – fully automated roboted packaging – transport to the supermarkets.

6.3 VAN DEN HEUVEL

The firm was called Van den Heuvel Dairy & Food Equipment (VDH) an internationally known supplier of high quality dairy machinery and processing equipment for the production and storage of dairy products (milk, cheese, butter, yoghurt among others) and liquid foodstuff. VDH also advices clients on production process efficiency and the supply of all the necessary technical parts and components of such equipment.

VDH offers a wide selection of both new, second-hand and refurbished machinery for the dairy industry, including yoghurt and cheese production lines, ranging from single components for dairy machinery to entire turn-key production lines.

VDH has been in operation for over 30 years in manufacturing and supplying dairy and liquid food processing industry equipment. They are able to tailor make equipment according to the client's specifications and budget. Capacities of the various equipment range from a capacity of 500-100,000 liters per day. This is both new and re manufactured versions. The company started as a family owned company.
On the day of the Mission visit there was a wide range stock of second-hand, refurbished and new equipment for entire cheese production lines, for example curd processors, cheese

presses, cheese moulds, brine-maturing installations, separators, and bactofuges. They also had a large selection of process- and storage tanks, pumps, milk filters, pasteurization units, homogenizers, yoghurt, butter, and cream installations.

Contacts +31 184-641266 or +31 184-642208

6.4 BRONKHORST GEDIZO

The company started the packaging of silage maize in the early 1990's. They are specialized in the processing and small unit packaging of high-quality animal forages like Lucerne and maize silage (25-50 kgs). They claim a large market share in Europe and also export to Gulf States and Egypt. They supplies packaged silage maize to many countries.

GEDIZO also has as a TMR of silage maize, sugar beet pulp, and breweries grains, and a mix of silage maize with grains specially developed for white-meat calves. They also package customized mixes on request. They sell maize silage in air tight pack, both small and bulk packages.

DAY FIVE: SATURDAY 17TH AUGUST 2013: POULTRY IN BARNEVELD AND DE HEUS BV FARM MACHINERIES IN ALBLASSERWAARD

7.1 POULTRY IN BARNEVELD

Program Manager – A..J. Vries: Dutch Poultry Centre

The Dutch Poultry Centre (DPC) is the network organization of Dutch companies active in the poultry sector. DPC promotes the Dutch poultry sector through innovation and knowledge exchange. The farm visited by Kenyan mission was 4th generation, having been established in 1932. Operations on the farm were highly mechanized (feeding, egg collection to packaging) with only 3 labourers (farmer and two assistants).

The farm had 40000 layers, with 13000 of them laying eggs. The housing was open cages and free grazing due to consumer demand. The farm was 22 acres, enough for rearing 52000 free range chicken. Eggs produced were mainly for export to Germany due to favourable price.

- Breed type was Navagel from France due to long laying cycle.
- Water and feed had a major influence on egg production. The layers were fed 120-172gms/day and clean drinking water provided ad libitum
- Weight of eggs was related to age and was on average 62 gms

- The 1st lay was at 19.5 – 20 weeks and end of laying (culling) was at 80 weeks.

7.1 DE HEUS BV FARM MACHINERIES IN ALBLASSERWAARD

Established in 1923, P. de Heus and Zonen Group B.V. is currently in the hands of the 4th generation. The farm specializes in export of agricultural machinery, tractors and construction machinery. 95% of sales and revenues are from overseas. The farm provides a full range of new and used tractor models and brands from all kinds of horsepower ranges for sale or export.

REFLECTIONS ON THE DAIRY MISSION FROM EDFA'S PERSPECTIVE

The Dairy Mission to the Netherlands was a great success, exceeding many of EDFA members' expectations. The EDFA team consisted of 17 members (five of whom were ladies) with one member failing to travel due to unavoidable circumstances. The Deputy MD for KVDA Mr. Francis C. Kipkoech also accompanied the EDFA team (as EDFA will be collaborating with KVDA on various fronts). The team's travel from and back to Kenya was coordinated and thus was smooth with no hitch experienced. The EDFA team had the following key areas/objectives as the basis of learning during the mission:

- General animal upkeep, including housing;
- Breeding, including calf rearing and process of dairy export;
- Feed/fodder management
- Farm mechanization;
- Training and extension services
- Milk processing/value addition
- Poultry farming;
- General organization of the Dutch society

LEARNING EXPERIENCES

(a) General Animal Upkeep and Housing

Of all the farms visited, the owners were there full-time. This formed the basis of the success of most of the farms. The farmers are very dedicated to their cows and thus have issues affecting their cows at the finger tips. DAIRY IS THEIR PRIMARY BUSINESS, hence they do it with passion and in large scale. Unlike most of EDFA members, Dutch farmers have a deeper understanding of their dairy animal behavior and thus are able to detect emerging issues and address them in time hence reducing costs/losses in their farms.

Farm fragmentation is not practices in the Netherlands

rather; amalgamation of land and operations is the main practice. This was an eye opener for EDFA members, most of who have bigger farms and likely to follow the trend of land fragmentation.

Record keeping is part and parcel of the farming in the Netherlands.

Cow housing is mostly standardized across the visited farms. The housing is designed to provide for cow comfort while ensuring efficiency in resource use and day-to-day operations.

Manure is a valued resource and its management is key (all the farms visited had silos for storing manure … unlike in our Kenyan scenario where we invest heavily in costly fertilizer, which in return has worsened soil acidity. All these provide opportunities to develop training/ capacity building programs to upscale the knowledge levels of farmers for the long-term development of the sector. In addition, farmer exchange program can be developed, especially targeting retired farmers/professionals who can come for holiday in Kenya and stay in the farms.

(b) Breeding

The predominant breed in Netherlands is the Friesian Holsteins. The animals have been bred over generations and thus are pedigree. This has positioned Netherlands in the international market as an exporter of dairy cows.

With well-structured breeding programs in place, Kenya can be the hub for supplying dairy breeds to the East and Central Africa region.

Calf rearing is held in high priority amongst the Dutch farmers. In return, they are able to serve their heifers as early as 13 months. This is contrary to most of our farmers who, on the least serve their heifers from 18 months and some do it in 30 or more months. Due to good animal husbandry, most Dutch farmers are able to serve their cows on an annual basis (high conception rate amongst their cows). It is the management of the cows that determines the success of any breeding program adopted by the farmer.

Opportunities exist in developing partnership with breeding institutions (CRV emerged as the top contender while Bles Dairies provided an opportunity when need to import heifers arises) from Holland to streamline the sector. Government involvement is important in ensuring a successful dairy sector especially in the breeding context.

(c) Feed/Fodder Management

The success of the Dutch dairy farmers lies (even historically) in their ability to produce and conserve food. Grass forms the bulk of their feed and thus grass management is highly upheld. In our context, grass is not an issue to focus in terms of management … they grow naturally, we do not apply manure, weeds/bushes are not managed. The same grass is ensiled, and cows rarely graze on them rather they are mowed to control uniformity of growth. Ensiling of fodder is by use of pits and wrapping with polythene materials.

Cows have food round the clock, unlike our scenario where food is given in rations due to inadequate supply. In that context, it is now a requirement amongst EDFA members to develop their grass for ensiling. Dutch farmers focus on cost control in feeding their cows, thus they do focus so mich on buying feed concentrates as they push up the production costs. Feed is provided to the cows based on their nutritional value … they utilize the services of feed labs.

For EDFA, the starting point is preparing land to plant forage while at the same time working on the grazing fields to rid them of weeds/bushes, level them to ease mowing. In addition, the fields' fertility will be enhanced to ensure maximum harvest. EDFA will be looking forward to developing partnerships with Dutch institutions (starting PUM) in improving fodder management. In addition, EDFA will develop a commercial wing to deal with business of selling fodder (which EDFA members will be producing on commercial basis).

(d) Farm Mechanisation

Dutch farmers have utilized mechanization to their advantage. Labor costs are very high (with minimum of 25 Euros per hour), and thus it is prudent to invest in machines for long term survival and to enhance farm efficiency. And to prove this, the PTC+ has 180 cows with 2 FTEs yet is producing an average of 10,000kg of milk/cow/year with the help of robots. Mechanization will undoubtly improve farm productivity.

This mechanization not only applies to the farm

management, but also in commercializing all processes including feed production and milk value addition/quality management. With simple machines, coupled with readily available labor, EDFA members were in agreement that they will improve their farm productivity by more than 100% in the next one and half year.

For a start, a number of EDFA members were of agreement that used machines which are still in good condition will be bought, and where necessary new ones to enhance farm efficiency. Their focus is on forage/silage harvesters, tractors, silage wrappers, milking machines, and milk cooling tanks. A number of Dutch firms were identified for collaboration and a need assessment will be undertaken to establish exactly what is needed by EDFA members.

(e) Training and Extension Services

Most Kenyan farmers have the will to undertake dairy farming. What they lack is the ability especially in terms of knowledge. Training amongst Dutch farmers is practical, it then means that Practical Training Centers will form the real agents of change in Kenya's dairy sector. The training sector, in its formative stage, was driven by the Dutch government and later on sold to the private sector to drive it. The training philosophy is 'Learning by Doing' … as it has a lasting impression on the learner rather than the theoretical approach mostly used in Kenya. The training should be step-by-step.

The large scale farmers can form an alternative to the government-sponsored training systems in Kenya. It emerged that the process of establishing a training institution follows the following simple process:

1. Needs assessment;
2. Design and implement applicable curriculum
3. Dimensioning of training facilities and tools
4. Training of local trainers (TOTs program) … for sustainability

Training programs must be commercialized for sustainability. In this regard, EDFA will strengthen its model farm development strategy for effective training of its members and local farmers.

(f) Milk Processing/Value Addition

Milk processing in Holland is driven by the large-scale multinational farmer owned processors. There is also a big participation of family-owned small-scale processors with those we visited specializing in cheese. Demand for the high-value products in Netherlands is high and equally competition for the same market is high. In this regard, the processors focus on producing quality products hence demand for quality milk from the farms. Sustainable milk processing is

made possible by an equally sustainable quality milk supply … an area EDFA sees itself as well positioned in.

EDFA members were unanimous in the need to first focus in producing quality and adequate milk as most of them operate on an average of 25% of their farm potential. EDFA were pleased to get assurance from Friesland Campina on their desire to establish a processing plant in Kenya. EDFA members have agreed to collaborate with them in ensuring the success of this endeavor.

ANNEXES

ANNEX 1. NABC – DUTCH DAIRY DEVELOPMENT PARTNERS (2g@there)

ANNEX 2. INVITATION LETTER NABC KENYA DAIRY MISSION

ANNEX 3. LIST OF PARTICIPANTS OF THE KENYA DAIRY MISSION TO THE NETHERLANDS

ANNEX 4. PROGRAMME DAIRY MISSION

ANNEX 5. FEEDBACK FROM PARTICIPANTS

ANNEX 5. KENYA DAIRY SECTOR MISSION FEEDBACK SHEET: VOICES FROM PARTICIPANTS

1. **In brief what were your expectations when you enrolled to join in this mission**

- To learn about milk marketing
- To learn how dairy farming is done and compare it with Kenya's. Point out areas that need improvement
- Make contacts with dairy industry players in Netherlands for future collaboration and sharing of ideas
- Look at the machinery/equipment used and which can be used in our farm
- To be re-equipped with skills in fodder production and management
- To learn general dairy husbandry techniques together with the standards and quality of dairy husbandry
- To be re-equipped with skills in dairy feed manufacturing (formulae and equipment)
- Create linkages with practical and academic gurus and business entities in dairy industry (production and processing)
- To visit and interact with practical dairy training institute in the Netherlands
- Compare functions of the Dutch Dairy Board with the Kenyan Dairy Board.
- Visit dairy farmers in the Netherlands to benchmark

2. **Among all the areas visited, which of them was MOST relevant for you? Why are the areas relevant?**

Among all the areas visited, which of them was MOST relevant for you?	**Why do you consider the above areas MOST relevant?**
The Schep Holsteins Friesland Dairy Farm 'Van Weperen'(Van Weperen Family)	The facilitators on the farms addressed in a big way the major challenges facing the dairy sector in Kenya i.e. the basic ration (roughage/fodder), breeding and calf rearing
Animal husbandry Fodder production	Fodder production is necessary because it leads to better milk production
Efficient production and preparation of Grass silage especially harvesting at early stage and using polythene bags. Feeding and care of cows and young dairy cows to reach maturity and be served by 14 Months old	Efficient production and use of high quality fodder result in more milk at lower cost of production. No use of a lot of concentrates. If you feed calves well you get low mortalities and you get them in calf and productive at an early stage reducing passengers (non productive cows) and giving income
Dairy training and research institutions PTC+, University of Wageningen, Dairy Campus, CRV Farm machinery and cow house equipment Feed manufacturers	In line with my organizational needs and goals
Farmer visits Dairy Training	They are relevant to my work and that's why the Ministry had allowed me to go the Netherlands

3. **Now that you are back from the mission? What are you able to implement immediately or in a few months ;Time-frame; Limitation and Support required**

Now that you are back from the mission? What are you able to implement immediately or in a few months	**By when do you intend to do the above? (time-frame)**	**What is your greatest LIMITATION in achieving your plan**	**What kind of support would you require from SNV, Agriterra or other parties to be able to implement your plan**

Change in the way young cows are fed. Stage and speed of harvesting fodder	Feeding is immediate Harvesting fodder efficiently could be from September2013 to January 2014 and beyond	For fodder pre-paration the major limiting factor is machinery especially tractors, bailers and forage harvesters.	Support in Kind inform of Machinery or support to buy the Equipment with good terms in terms of cost, spread of payment and interest rates.
Livestock fodder security and commercialization Training programs in dairy industry (A.I., feed manufacturing, processing Manufacture my own feeds Commercialize value added products form UEAB Breed and sell pedigree cows (lactating and heifers)	All these are on progress Full implementation latest December 2013	Processing equipment Financial resources Training resources	To facilitate training programs to kick off PTC+ modules if available for comparison of models Linkages with training organizations in Netherlands Develop and tailor the already existing facility to a modern training facility at University of Eastern Africa Baraton. Organize exchange programs at UEAB with Netherlands Funds for renewable energy development at UEAB Build a modern Cow house to be used for training and production purposes Provide some of

			the equipment for silage for fodder management and preservation so that UEAB may use the equipment for production of a larger volume of fodder.
Have discussed with our dairy training school, Director and SNV and hoping to follow up so that we can train Kenyans jointly with the dairy PTC Netherlands	Hope the plans will be in place by Next year. (our trainers to work together with PTC)	The ideas not followed up.	SNV to connect us with the PTC
I am championing for the cows' comfort in the zero grazing sheds Train farmers on the importance of keeping records for their dairy businesses. Empower farmers to consider dairy farming as a business that they need to invest in in order for it to have some economic sense. Insist on fodder establishment and conservation. Maize (maize silage) is always given emphasis here. Train extensively on proper calf rearing	The trainings are on. The first 2 actions are immediate implementable. However, the results of the last 3 might take a little longer depending on factors such as rain, farmers' willingness etc.	I have a huge work load. MWDL has employed only one extension officer. I am required to serve about 5,500 active farmers. You can bet that it's very difficult to organize all activities under the extension section such as the trainings, follow-ups, projects monitoring etc. Extension services are in very high demand in Mukurwe-ini region. Interference from the top management.	I would want a colleague, a full time extension officer; someone I can exchange notes with, think together, share duties and responsibilities. Capacity building and especially about good governance and leadership for the board of governors and the managers. This might help deal with the interference from this higher office. My efficiency and effectiveness as a dairy extension worker will partially be achieved through

		Willingness of the farmers to retire from the old odd way of dairying	trainings by more experienced extension specialists like Frans, Erik and Lucas.
To produce fodder To improve cow comfort	Improvement of cow comfort is immediate	Finance due to the low milk production	Technical and financial support from SNV

4. **What linkages do you see as important and achievable with the Dutch dairy sector, whether private or public**

- Education/training in efficiency of operations, value addition (milk processing) and dairy recording systems.
- Machinery/equipment/technology
- Training and exchange programs
- AI services/breeding
- Feed formulation preservation and Feed commercialization
- Renewable energy models suitable for Kenya's situation
- The exchange program. This is a learning experience for the people involved in this sector.
- The projects spearheaded by the Dutch-sponsored NGOs.
- The business development strategy
- Technical and knowledge support

5. **What suggestions or ideas would you like to give to the organizers of the mission (SNV, NABC and Agriterra) – to improve such missions in the future**

- To have a meeting of the participants beforehand so that all have nearly the same objectives and understanding of the mission.
- To organize hands on excursions for at least one month on various farms and organizations
- To organize pilot projects in dairy industry across the country to cater for the small scale farmers as well
- More time maybe another week as the group had to be divided and so some people missed to visit some places.
- Visit to the ministry of Agriculture

- I think working with a smaller group would be great. It would give the participants an opportunity to learn more, it would be much involving, and the coordination of the group would be easier. Comparing the performance of the groups will give the organizers an opportunity to see where improvement is needed in their work.
- Consider people whom objective is similar. E.g. extension workers will want to learn more about the cheapest way to produce a lot of milk, so they will want to learn more about feeds and feeding for example, while machinery will be of more relevance to the large scale farmers.
- Experts from Netherlands should visit Kenyan Farmers.
- Need for follow up after mission
- Help in obtaining suitable machinery from Netherlands