Natural Livestock Farming

An effective approach to reduce the use of anti-microbials and other chemicals - towards sustainable dairy production

Katrien van’t Hooft, Dr. G.Gebru, M.N.B.Nair, E.Katushabe, Dr. M.Groot
ESAP dairy conference, Addis Ababa, 29 Oct 2021
Katrien van’t Hooft: Dutch veterinarian with 30+ years of dairy experience worldwide

Both smallholder and large scale dairy farming

Lead executive board
Foundation for Natural Livestock Farming (NLF)
Excessive use of antibiotics and Anti-Microbial Resistance is a One Health issue.
If no action at farm level:

Antibiotics, as well as dewormers and insecticides, increasingly in-effective for humans and animals alike.

Local dairy markets may collapse in countries with insufficient residue control.

Affecting farmer livelihoods and country economics.
Why Natural Livestock Farming?

**Expertise**: effective support to dairy farmers to reduce their use of antibiotics and other chemicals

**Dairy systems**: both smallholder and large scale dairy farmers

**Resulting in**: increased quality and quantity of milk, improved farm income, and up to 87% reduction of antibiotic residues
Natural Livestock Farming: a practical contribution to One Health

Healthy environment

Healthy animals

Residue free products

Healthy people
2014 Exchange program veterinarians and farmers between Netherlands and India

Topic: use of herbs to reduce need for antibiotics
2015: Exchange also included Ethiopia and Uganda

Topic: effect (cross-) breeding on use of antibiotics & acaricidaes, and on milk quality
Leading to joint strategy:
Natural Livestock Farming 5-layer strategy for Sustainable Dairy Farming
How is NLF working?

International collaboration (Ethiopia, India, Netherlands, Uganda) combining a variety of farming systems

**Building on a variety of knowledge systems**

Combining expertise from the grassroots (farmers and veterinarians) with scientific back-up

**Pilots with implementation of NLF 5-layer strategy**
NLF activities and results in India, Ethiopia, Uganda, Netherlands
Smallholder dairy INDIA

- Largest dairy producer in the world, based on 98% smallholders with 2-5 cattle/buffalo
- Decades of continued crossbreeding with HF
- Unintended side effects: high disease incidence & antibiotic use
Other challenges dairy India

Over the counter sales of antibiotics & other chemicals

+ limited residue control
NLF in India

Trans-Disciplinary Institute (TDU) + GLOHMSIWA:

• Curative and preventive use of herbs / natural products
• Based on knowledge from farmers, Ayurveda science, & western science

Documentation and validation: 353 out of 441 veterinary herbal remedies acknowledged safe and efficacious
Identification of Ethno Veterinary Practices (EVP) with farmers & healers

Prioritization of animal health conditions

Documentation of EVP

Desk research & literature references (multiple sciences)

Identification of safe and effective remedies

Joint rapid assessment

Clinical trials of selected EVP

Promotion: Training vets and farmers Home herbal gardens

Enterprise & product development
EVP remedy for Mastitis

Aloe vera

Curcuma longa

Calcium hydroxide
Recovery:
- Acute mastitis 79,3 %
- Subclinical: 82,5 %
- Chronic: 78,6 %
Fever
Warts / Udder pox
Metritis /
Repeat breeding
Bloat / indigestion
NLF India: activities & results (now with NDDB)

1. Nation wide training of vets and farmers on herbal medicine for common cattle diseases
2. Videos on herbal treatments in local languages
3. Analysing results
## Feedback from over 500,000 cases from NDDB through INAPH *
### Efficacy of EVPs for 24 clinical conditions in cattle from 2017-18 to 2021-22

<table>
<thead>
<tr>
<th>S No</th>
<th>Ailment</th>
<th>Total treated cases</th>
<th>Total clinical recovery</th>
<th>% clinical recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fever</td>
<td>113172</td>
<td>94583</td>
<td>83.6</td>
</tr>
<tr>
<td>2</td>
<td>Diarrhoea</td>
<td>110046</td>
<td>93658</td>
<td>85.2</td>
</tr>
<tr>
<td>3</td>
<td>Acute Mastitis</td>
<td>104475</td>
<td>82878</td>
<td>79.3</td>
</tr>
<tr>
<td>4</td>
<td>Chronic mastitis</td>
<td>52791</td>
<td>41502</td>
<td>78.6</td>
</tr>
<tr>
<td>5</td>
<td>Indigestion</td>
<td>27358</td>
<td>22961</td>
<td>83.9</td>
</tr>
<tr>
<td>6</td>
<td>Sub-clinical Mastitis</td>
<td>23986</td>
<td>19780</td>
<td>82.5</td>
</tr>
<tr>
<td>7</td>
<td>Anoestrus</td>
<td>17617</td>
<td>13132</td>
<td>74.5</td>
</tr>
<tr>
<td>8</td>
<td>Blood in milk</td>
<td>15718</td>
<td>13269</td>
<td>84.4</td>
</tr>
<tr>
<td>9</td>
<td>Repeat breeder</td>
<td>13262</td>
<td>9017</td>
<td>68.0</td>
</tr>
<tr>
<td>10</td>
<td>Deworming</td>
<td>11916</td>
<td>10690</td>
<td>89.7</td>
</tr>
<tr>
<td>11</td>
<td>Udder oedema</td>
<td>9567</td>
<td>7993</td>
<td>83.5</td>
</tr>
<tr>
<td>12</td>
<td>Wound</td>
<td>6534</td>
<td>5339</td>
<td>81.7</td>
</tr>
<tr>
<td>13</td>
<td>Retention of placenta</td>
<td>5744</td>
<td>4094</td>
<td>71.3</td>
</tr>
<tr>
<td>14</td>
<td>Bloat</td>
<td>5220</td>
<td>3959</td>
<td>75.8</td>
</tr>
<tr>
<td>15</td>
<td>Ectoparasites/ticks</td>
<td>4164</td>
<td>3444</td>
<td>82.7</td>
</tr>
<tr>
<td>16</td>
<td>Teat obstruction</td>
<td>4030</td>
<td>2714</td>
<td>67.3</td>
</tr>
<tr>
<td>17</td>
<td>Endometritis</td>
<td>3770</td>
<td>3056</td>
<td>81.1</td>
</tr>
<tr>
<td>18</td>
<td>Agalactia</td>
<td>2721</td>
<td>2048</td>
<td>75.3</td>
</tr>
<tr>
<td>19</td>
<td>Downer</td>
<td>2720</td>
<td>1801</td>
<td>66.2</td>
</tr>
<tr>
<td>20</td>
<td>Wart</td>
<td>2573</td>
<td>1802</td>
<td>70.0</td>
</tr>
<tr>
<td>21</td>
<td>Lumpy Skin Disease</td>
<td>2258</td>
<td>1693</td>
<td>75.0</td>
</tr>
<tr>
<td>22</td>
<td>Swelling/ Joint Pains</td>
<td>1913</td>
<td>1424</td>
<td>74.4</td>
</tr>
<tr>
<td>23</td>
<td>Prolapse</td>
<td>1543</td>
<td>1052</td>
<td>68.2</td>
</tr>
<tr>
<td>24</td>
<td>Poisoning (unknown origin)</td>
<td>647</td>
<td>448</td>
<td>69.2</td>
</tr>
<tr>
<td><strong>Total EVM Treatment</strong></td>
<td><strong>543745</strong></td>
<td><strong>442337</strong></td>
<td><strong>81.4</strong></td>
<td></td>
</tr>
</tbody>
</table>
Antibiotic residues in farmer’s milk samples one year after EVP training

<table>
<thead>
<tr>
<th>MILK Union</th>
<th># Farmers</th>
<th>Residue Negative</th>
<th>Residue Low Positive</th>
<th>Residue Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allapra</td>
<td>15</td>
<td>12</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Arakkapady</td>
<td>15</td>
<td>11</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Chakkampuzha</td>
<td>10</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Maneed</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Manikyamangalam</td>
<td>15</td>
<td>12</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Monippally</td>
<td>10</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Puthrika</td>
<td>10</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sreemoolanagaram</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Thirukanurpatti (TN)</td>
<td>20</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Aralumallige (Karnataka)</td>
<td>20</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140</strong></td>
<td><strong>123</strong></td>
<td><strong>11</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td><strong>Percentage</strong></td>
<td><strong>87.86%</strong></td>
<td><strong>7.85%</strong></td>
<td><strong>4.29%</strong></td>
<td></td>
</tr>
</tbody>
</table>
Comparing farm expenditure in Rupees for treatment with conventional medicine and EVP (1 USD = 73.52 Rupees on 01/12/2020)

<table>
<thead>
<tr>
<th>No.</th>
<th>Disease conditions</th>
<th>cases</th>
<th>western drug treatment</th>
<th>EVP treatment</th>
<th>Amount saved</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mastitis</td>
<td>35</td>
<td>3000</td>
<td>120</td>
<td>2880</td>
<td>96</td>
</tr>
<tr>
<td>2</td>
<td>Maggot wound</td>
<td>28</td>
<td>963</td>
<td>60</td>
<td>882</td>
<td>92</td>
</tr>
<tr>
<td>3</td>
<td>Bloat &amp; Indigestion</td>
<td>34</td>
<td>719</td>
<td>224</td>
<td>495</td>
<td>69</td>
</tr>
<tr>
<td>4</td>
<td>Repeat breeding</td>
<td>23</td>
<td>3061</td>
<td>430</td>
<td>2631</td>
<td>86</td>
</tr>
<tr>
<td>5</td>
<td>Cow pox</td>
<td>18</td>
<td>583</td>
<td>335</td>
<td>250</td>
<td>43</td>
</tr>
<tr>
<td>6</td>
<td>Foot and Mouth Disease (FMD)</td>
<td>22</td>
<td>3165</td>
<td>1640</td>
<td>1525</td>
<td>48</td>
</tr>
<tr>
<td>7</td>
<td>Diarrhea</td>
<td>3</td>
<td>500</td>
<td>166</td>
<td>334</td>
<td>67</td>
</tr>
</tbody>
</table>
NLF in Ethiopia
Focus in peri-urban smallholder dairy

- Improve calf management
- Cattle feeding and housing
- Reduce use of antibiotics
- Milk quality
- Revitalize knowledge herbal medicine
Healthy Cows – Healthy Food
Pilot project 2018-2020 Debre Zeit

1. Enhance (VDFACA) laboratory capacity
2. Improve cattle health in peri-urban dairy farms, through implementation of the NLF 5-layered methodology on 60 farms
3. Establish outcomes in lab through milk quality control
Laboratory capacity improvement VDFACA

7 staff trained at Wageningen Food Safety Research (Oct2018)

- Total bacterial count (TMC)
- Somatic cell count (SCC)
- Identification selected pathogen bacteria (Salmonella, E.coli & Staph.aureus)
- Antimicrobial resistance (AMR) profiles of the identified pathogen bacteria
- Antibiotic residues

Next to the training, laboratory supplies were purchased and sent to Ethiopia
NLF Ethiopia / ESAP – field activities

Participatory analysis and monitoring of cattle health situation

Using “NLF wheel of animal health and wellbeing”
Training on herbal medicine

Training on improved calf care and hoof trimming
Project results – milk quality 
(info from VDFACA and WFSR)

Table 1. Comparison NWO-ARF milk data on pathogen bacteria isolation test results

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>E.Coli</th>
<th>Salmonella</th>
<th>Staph Aureus</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWO/ARF</td>
<td>60</td>
<td>11.67 %</td>
<td>1.67 %</td>
<td>46.67 %</td>
</tr>
<tr>
<td>Reference data</td>
<td>59</td>
<td>25.42 %</td>
<td>1.69 %</td>
<td>67.80 %</td>
</tr>
</tbody>
</table>

Reduction in the presence of E. Coli with more than 50 % and Staph aureus by 30 %

Milk quality data of the project samples compared with reference samples also showed that in most aspects (fat, protein, lactose, solid non-fat and density) the project samples scored better than the reference samples from comparable dairy farmers.
More project results:

- 8% reduction of antibiotic residues in milk
- 50% increase in milk quantity
- 33% increase in farm income
- 60% reduction in calf mortality
- 20% reduction of average costs for cattle health

Herb technologies proved especially appropriate for women – raising gender equality and women's leadership skills.
UGANDA – one of the main challenges for dairy farmers:

- High incidence of ticks & tick-borne diseases
- High use of acaricides for tick control
- High use of antibiotics due to East Coast Fever
- Ticks increasingly resistant against acaricides

Biodiversity loss: bees, butterflies, tick eating birds

No control of chemical residues in milk
Influence of continued crossbreeding Ankole Longhorn with Holstein Friesian (HF) breed
NLF in Uganda

• Piloting herbal alternatives + application methods for tick control (2017-2019, with SNV Uganda) incl. training by Indian NLF partners
• Initial promising results – but more steps required
• Herbal garden initiative picked up
NLF Uganda – current activities

• Community milk tank
• Value addition incl. yoghurt and butter making
• Planting indigenous trees species
• Beekeeping
• Restocking local Ankole Longhorn cattle in central cattle corridor
• Promote natural fencing
• Crossbreed with robust cattle (Vleckvieh) instead of HF
Challenges large scale dairy farming - Netherlands

Mastitis, calf diarrhea, hoof problems
Search for increasing life-span
Environment: biodiversity loss & excess nitrogen

Government decree 2012: obliging livestock sector to reduce use of antibiotics by 70% (compared to 2009) before 2015. This was successful.
NLF Netherlands - activities

- Promotion of herbs in grassland and cattle feeds
- Training of 400 farmers and 50 vets on safe use of herbal products
- Requested: pilots on natural control of worms and ticks
Outcome: increased resilience

- **More resilient cattle**: cattle productive while able to withstand local challenges
- **More resilient cattle health system**: more farmer independence
- **More resilient livelihoods and food systems**: food security in the face of climate change & COVID-19, strengthened role of women
- **More resilient marketing**: consumer confidence in residue free products
- **More resilient human & animal health care**: reduced AMR
- **More resilient environment**: less chemicals in soil, water and biodiversity
- **More resilient country economics**: improved dairy production and reduced imports of livestock products & chemicals
- **Lower CO2 footprint in livestock production**: improved productivity (reduced CO2 per kg of milk), reduced use of improved soil fertility
What can NLF offer you:

Webinars and training programs e.g.:
- Natural mastitis control (April 2020)
- Natural calf raising (August 2021)
- Nature Based Solutions - herbs for dairy health India and Netherlands (Oct. 2021)
- Upcoming: FMD

Facilitation of:
- Support to dairy programs
- Exchange programs on livestock-health related topics

Participate in NLF network & join the upscaling!
Take away lessons - conclusions

1. Only milk control will not solve the milk residue problem
2. Farmers are the starting point for residue-free milk
3. Start with farmers’ perceived challenges is key to success
4. Besides farmers, veterinarians are crucial to involve
5. Africa can learn from India: strengthen a tri-partite learning between Ethiopia-Netherlands-India
6. Herbs are a perfect way to engage women (dairy) farmers
7. NLF 5-layer strategy now has ‘proof of concept’:
   it is possible to have a win-win-win-win-win-win:
   cattle health, milk quantity, milk quality, farm income & environment!
Together we can make change happen!

Get in touch at:

katrien@naturallivestockfarming.com