Lumpy Skin Disease in Israel
2012-2013

Nadav Galon, CVO Israel
FAO Webinar 07-04-2015
6 Veterinary Districts

- DVO -6
- Vets - 33
- Inspectors – 14
- Total – 53

• ~ 100 non- gov. vets - working with cattle
Dairy - zero grazing

Beef - zero housing

Maps - from E. Klement
## Previous LSD outbreaks in Israel

<table>
<thead>
<tr>
<th>Year</th>
<th>region</th>
<th>No of herds</th>
<th>Type of farm</th>
<th>Pre Vacc.</th>
<th>Control method</th>
<th>Culled / died</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>Western Negev</td>
<td>1</td>
<td>Dairy “0 grazing “</td>
<td>NO</td>
<td>Stamping Out</td>
<td>&gt;800 heads</td>
</tr>
<tr>
<td>2006</td>
<td>Southern coastal plain</td>
<td>1</td>
<td>Dairy “0 grazing “</td>
<td>NO</td>
<td>Vaccinate, clinical test &amp; cull</td>
<td>206 heads 33% of herd</td>
</tr>
<tr>
<td>2007</td>
<td>Western Negev</td>
<td>9</td>
<td>Dairy and Beef Small size pasture</td>
<td>Sheep Pox RM 65</td>
<td>Clinical test &amp; cull</td>
<td>508 Dairy 5.5% Beef 33%(10-41)</td>
</tr>
</tbody>
</table>
LSD – Control Strategy 2007-2012

- Trans-boundary disease from the South Summer disease (June-October)
- VS can detect the first cases (dairy herds)
- Sheep Pox vaccine protects
- Vaccination & culling stops spreading
- The vector is Stomoxys & “others”
LSD outbreaks in Israel
Northern Golan 2012
Druze cattle herds
Northern Golan
Initial picture
28.07.2012

- ~ 40 Beef herds
- 4,000 cows
- Mutual grazing
- Poor pasture
- Mountains, forests
- Over crowding
- Zero vaccinated
- 10-60% morbidity
Detection of Incursion
~ 6-8 weeks from index case to VS knowledge

- Remote area near the northern border
- Extensive part time Beef Farmers
- Rural private vets
  - No regular farm visits
  - Limited knowledge of emerging diseases
  - Not reporting to VS
- No enough active surveillance by the VS
Why didn’t we cull infected cattle

- Thousands of infected & incubating heads
- No ability to limit animal movements
- No facilities for repeated clinical evaluation
- No collaboration of farmers for restrain & cull
- No access to evacuate dead and culled cattle
- Risk of reintroduction along the border
- Druze Elders (leaders) object to culling
Immediate control measures

**Beef Herds**
- Zoning & Movements restrictions
- zone Vaccination – Sheep Pox JOVAC
- Insects control – limited
- Awareness campaign
- No culling

**Dairy herds**
- + Culling clinical cases
Sheep Pox vaccine
RM/65

$10^3$ TCID
1 ml sc

Sheep-pox is a contagious disease caused by Capripox virus. It is characterized by skin and mucous membrane lesions, but the systemic reaction may lead to animal death. Vaccination is the only prevention method to control the high level of morbidity and mortality caused by this disease.

**COMPOSITION:**
Each dose of the vaccine contains:
- Modified Sheep pox virus,
- RM/65 strain at least $\ldots \ldots 10^{3.0} \text{ TCID}_{50}^*$
  (*Tissue culture infective dose 50%)

**INDICATIONS**
Prevention of sheep pox.

**METHOD OF IMMUNIZATION**
- Primer vaccination.
  - One injection above the age of 3 months.
  - If vaccination is performed on less than 3 months old lamb, a second injection must be given 6 months later.
- Yearly boosters.
  If necessary sheep pox vaccine may be administered to pregnant ewes, which will transfer immunity for young lamb during the first 3 months of age.

**METHOD OF USE AND DOSAGE**
- Cold and sterile normal saline (diluent) is used to reconstitute the pelletted freeze-dried vaccine. The reconstituted vaccine must be protected from light and heat and be utilized immediately (limit time is 2 hours).
- Use 100 ml of diluent for vial of 100 doses, and 50 ml for 50 doses vial
- Inject 1 ml subcutaneously per animal into the sternum area, where there is no wool, behind the elbow.
- A small nodular reaction may appear at the point of inoculation (TAKES), which disappears later.

**RECOMMENDATION**
- Never use a syringe and a needle sterilized with a chemical agent.
- Use aseptic technique.
- Reconstitute the vaccine immediately before use and destroy any unused portion.

**STORAGE**
The vaccine can be stored at $+2^\circ$C to $+8^\circ$C for two years.

**PRESENTATION**
Vials of 50 doses and 100 doses.
مرض الجلد العقدي

(LSD Lumpy Skin Disease)

خلال الأشهر الأخيرة تم تشخيص مرض الجلد العقدي في إقليم منطقة.

سبب المرض - فيروس الجلد العقدي، ينتشر الفيروس الحرارة والمؤثرات البيئية إلى حد ما ويمكنه البقاء حياً في القشرة الجافة للأفوائ الجلدية وفي الجلد المريحة لفترة طويلة قد تصل إلى أشهر خصوصاً في نفس الظروف في النزف أو الزيادة في أسجة الشمس.

طرق نقل العدوى - ينتقل المرض عن طريق دفع الحشرات مثل الذباب والناموس.

العلاج - المرض ليس له علاج نواعي خاص به النظام الأعراضي والداعم.

منع المرض - وسائل العلاج الفعالة تطعيم، ورش مبيدات حشرية واستعمال طرق مختلفة للحد من تواجد الحشرات المكافحة. يجب رش الحيوانات بالمواد المبيدات الحشرية المصادقة استعمالها: الحد من حركة الحيوانات.

البيئة والإعلام الفوري مهم جداً. عند أي حالة شك في التعرف للمرض يجب على الفيرو اي اعلام الدائرة البيطرية.
Lab diagnosis techniques


- **Routine**
  - PCR: blood, skin
  - RT-PCR: blood, skin

- **Research**
  - PCR saliva, synovial fluid
  - Isolation
July 2012

Maps – M. Bellaiche
December 2012
January 2013

Change the Vaccine !!
Sheep-pox is a contagious disease caused by Capripox virus. It is characterized by skin and mucous membrane lesions, but the systemic reaction may lead to animal death. Vaccination is the only prevention method to control the high level of morbidity and mortality caused by this disease.

**COMPOSITION:**
Each dose of the vaccine contains:
- Modified Sheep pox virus,
- RM/65 strain at least $10^{4}$ TCID$_{50}$
  (*Tissue culture infective dose 50%)

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  - One injection above the age of 3 months.
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**PRESENTATION**
Vials of 50 doses and 100 doses.

"POX 10" = $10^{4}$
2ml dose
Neethling Vaccine

- Lumpy Skin Disease (LSD) vaccine contains the proven **Neethling strain**
- Protect bulls against virus excretion in the semen
- Ensures sufficient protection against field strains of Lumpy Skin viruses
- Stimulate immunity in 7 - 14 days
- The vaccine is safe to use in PREGNANT animals

**Recommendations**

**Calves:** From 4 - 6 weeks of age

**Adults:** Yearly vaccinations ensure good
Neethling
post vaccination response

KVI developed PCR differentiating wild virus from vaccine strain
New Control measures- March 2013

- Emergency order to farmers to vaccinate - CVO
- 2 vaccines: “POX 10” and Neethling
- Vaccination by gov’t and non-gov’t vets
- Mandatory reporting of vaccination to VS

- Test & cull & compensate – DVO
- ~ Vaccination coverage- 90% dairy 70% Beef
May 2013
July 2013

Movement of infected cattle
# of new herds per month

![Bar chart showing the number of new herds per month from July 2012 to August 2013. The chart indicates a significant increase in May 2013.](chart_image)
Herd Type by Month of Index Case
Transmission- know & don’t know

• More than one vector?
• Varies in region, season, housing type
• Slow spreading (vs Ephemeral fever BEF)
• With and without cattle movement
• No effective insect control

• Cattle movement: legal (un dx) & illegal
  (Transit permit is required prior to moving)
Moshav Kanaf - 5 dairy farms, 1 feedlot
## Kanaf farms - variability

<table>
<thead>
<tr>
<th>Farm</th>
<th>Heads in herd</th>
<th>Clinical cases</th>
<th>Duration (d) first- last case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy 1</td>
<td>219</td>
<td>8%</td>
<td>91</td>
</tr>
<tr>
<td>Dairy 2</td>
<td>75</td>
<td>16%</td>
<td>36</td>
</tr>
<tr>
<td>Dairy 3</td>
<td>50</td>
<td>2%</td>
<td>0</td>
</tr>
<tr>
<td>Dairy 4</td>
<td>475</td>
<td>2%</td>
<td>85</td>
</tr>
<tr>
<td>Dairy 5</td>
<td>40</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Feedlot</td>
<td>300</td>
<td>0%</td>
<td>0</td>
</tr>
</tbody>
</table>
Outbreak Timeline

Estimated introduction: ?/06/2012

1st Dx by VS-KVI: 26/07/2012

Vaccination: Pox-1: 28/07/2012

1st dairy case: 24/10/2012

Vaccination: Neethling Pox-10: 10/03/2013

Sporadic cases: May 2013

Last reported case: 29/08/2013
## Outbreak Losses - October 2013

<table>
<thead>
<tr>
<th></th>
<th>Beef- Pasture</th>
<th>Feedlot</th>
<th>Dairy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herds exposed</td>
<td>141</td>
<td>9</td>
<td>143</td>
<td>293</td>
</tr>
<tr>
<td>Heads exposed ~</td>
<td>40,000</td>
<td>10,000</td>
<td>100,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Mortality #</td>
<td>561</td>
<td>46</td>
<td>25</td>
<td>632</td>
</tr>
<tr>
<td>Destroyed #</td>
<td>17</td>
<td>0</td>
<td>434</td>
<td>451</td>
</tr>
</tbody>
</table>

Total Compensations paid ~ 1 mil €
value of Beef Cow ~ 1,000 €
value of Dairy Cow ~ 2,500 €
Additional Farmers losses ~ 2-3 mil €
International collaboration

• Eeva Tuppurainene — field visit Sep. 2012
• OIE –regional meeting, Cyprus, Feb. 2013
• EFSA - workshop- Israel data presented
• Contacts- EU, PAT, Jordan, Turkey, Cyprus
• Greece Seminar March 2015 (inc. Bulgaria)
• FAO EuFMD Webinar April 2015
March 2015 Risk Analysis

• Regional epidemiology unclear... threat still exist
• Few suspected cases, tested negative
• Mandatory Vaccination (reevaluated annually)
  – Performed only by private vets
  – Vaccine Coverage and portion (estimate)

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Dairy</th>
<th>Beef</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccinated herds</td>
<td>90%</td>
<td>80%</td>
</tr>
<tr>
<td>OBP Neethling</td>
<td>80%</td>
<td>50%</td>
</tr>
<tr>
<td>ABIC POX 10 (RM 65)</td>
<td>20%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Future Challenges

• Active surveillance
• Research (KVI, Koret Vet School, int’l )
  – Epidemiology
  – Entomology
  – Vaccine – effective, safe, affordable
• Regional collaboration
• Int’l partners – welcome !!
“Every challenge is an opportunity”

• **Thanks to:**
  – IVSAH
  – KVI
  – Koret Vet School
  – Hachaklait & private vets
  – farmers

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[www.vetserv.moag.gov.il/vet](http://www.vetserv.moag.gov.il/vet)