Vaccine Storage, Transport & Management

Risk and precautions
Only use vaccines that have been stored correctly; destroy (through incineration) vaccines that have been stored outside the recommended temperature range or that have exceeded the expiry date.

Key points
- High quality, inactivated (killed) vaccines providing at least 1 year immunity should be used [OIE, 2013]
- For storage of vaccines, also see manufacturer’s instructions.

Cold chain and stock management
The cold chain and stock management should ideally be managed by an authority that has experience with, and an existing procedure for, the handling of animal or human vaccines.

The careful and correct management of the cold chain (the temperature of the vaccines) is essential to ensure that the rabies vaccines are stored and transported to the field correctly and that the vaccines are viable at the point of vaccination.

Rabies vaccines can be destroyed if exposed to UV or fluorescent light, refrigerated to a temperature below 2 °C or frozen, subjected to temperatures above 8 °C, or packed exceeding the storage capacity.

Monitoring is needed to ensure that vaccine cold chain and stock management are conducted properly to maintain temperature between 4 and 6°C.

The following should be done by the provincial logistic coordinator (or similar):
- Develop a monitoring schedule
- Fill out the monitoring form
- Respond if any fault is discovered in storing and cold chain management by immediately notifying relevant staff and ensuring improvements and contingencies are in place to prevent the issue happening again.
**Materials & equipment**

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Vaccine refrigerator - designed specifically for vaccine storage.</td>
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<tr>
<td>(Some domestic fridges with manual defrost might also be suitable.)</td>
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<tr>
<td>Thermometers (digital with small probes attached, and standard)</td>
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<tr>
<td>Vaccine store bin</td>
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<td>Temperature record ledger</td>
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<td>Vaccine stock ledger</td>
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<tr>
<td>Vaccine monitoring form</td>
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<tr>
<td>Cool box large</td>
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<tr>
<td>Cool box small</td>
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<tr>
<td>Cool packs: Recommended made from plastic (e.g., plastic bag or bottle filled with water)</td>
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<tr>
<td>Monitoring Form</td>
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<tr>
<td>Backup generator and fresh fuel in case of power failure</td>
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<tr>
<td>Styrofoam box</td>
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<td>Safety box (box for sharp objects)</td>
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**Receiving the vaccine**

The receiving officer should:

- Inspect the vaccine document and record the name, type of vaccine and amount, doses per bottle, batch number, and expiry date. Record in the stock ledger.
- Check the temperature by using a digital thermometer inserted into the package. If the temperature is outside the 2° to 8°C range or the expiry date is exceeded, the vaccine is unusable and should be rejected.

If any inconsistencies in the documentation or physical conditions are found, this should be reported to the logistic coordinator.

**Vaccine storage**

- Vaccines should be stored in the vaccine refrigerator supported by properly maintained back up power generators.
- Rabies vaccines must be stored between 2 and 8°C and the temperature regularly monitored, and recorded on the temperature ledger, to ensure the integrity of the cold chain (water bottles or gel packs in the door of storage units can help buffer temperature fluctuations).
- Vaccines should not be packed tightly together—air must be able to circulate.
- It is advised to store vaccine bottles in clear plastic containers which are clearly labelled to avoid unnecessary opening. Placing gel packs within containers can act as a further temperature buffer.

**Storage management**

- Stock should be rotated to ensure oldest vaccines, within expiry dates, are used first. Therefore all new vaccines should be packed behind the older vaccines.
- The store records should be updated daily on the monitoring form.
- If the power to the fridge goes off, do not open the refrigerator.
If power is off for more than 4 hours, move the vaccine into a styrofoam box with cool packs from another source. Monitor and record the temperature twice a day. Ideally transfer the vaccine in cool boxes to another facility with a fridge and properly maintained back-up generator (e.g. the local hospital).

**Transport to the field**

- The quantity of vaccines needed for the projected work should be collected from storage early morning or the night before.
- To hold and transport vaccines to the field they should be placed in the large insulated cold box with cool packs:
  - Cool packs need to be cooled in the freezer for at least 24hrs – they can be frozen as long as the temperature of the vaccines does not drop below 2°C.
  - About 60% of the volume of the cool box should be the cool packs which should line the bottom, sides and top of the cool box and cover the top of the vaccines.
  - The vaccine can be stored in the original packages inside the box.

![Image of people carrying cool boxes]

[Source: World Animal Protection]

- When driving, store the large cold box in the coolest part of the vehicle, out of direct sunlight and off hot surfaces. When parked, store the box in the coolest possible spot, for example in the vehicle parked in the shade or with you in the shade. Cover the box with paper or boxes to increase insulation and slow down heating.
- The temperature of the large cold box should be checked and recorded once an hour to make sure that the temperature is between 2°C and 8°C. Using digital thermometers with small probes attached for remote reading will allow temperature reading without regular opening of cool boxes.

**During vaccination**

- On site, the vaccine can be transferred to the small cold box with cold packs to increase portability. The vaccine will keep cool for up to 4 hours (depending on the number of times the box is opened and ambient temperature).
- Check the temperature of the small cold box once per hour and record.
- Once a vial of vaccine is opened all of the vaccine must be used as recommended by the manufacturer. It is best to use the vaccine on the same day it is opened.
Managing remaining vaccine and waste disposal

- At the end of the vaccination, all used needles and syringes should be placed in the safety box for correct and safe disposal.
- All unused vaccine that has not been maintained at 2°C to 8°C and sharps (needles) should be pooled and incinerated once per week.
- Any unopened vaccine in the small cold box can be returned to the large cold box if the temperature has remained between 2° and 8°C, as shown by the temperature records.
- Any vaccine remaining in the large cold box should be returned to local storage and must be used the following day.

Monitoring vaccine stock

It is important to monitor the vaccine stock to avoid vaccine shortage in the field. Make sure to record the number of vaccines used in the stock ledger and calculate the remaining numbers at the end of each day.

References