Research into welfare of seal pups during and after rehabilitation

Examples from studies of the harbour seal

*Phoca vitulina*
Original study aim 1997–2004: to see if we could get pups to gain sufficient weight to allow them to be released close to the natural weaning period in the wild – to facilitate post-weaning exploration, geographical orientation and colony socialisation in same period as wild pups, while older seals still inshore undergoing annual moult
Growth rate of ‘fast-track’ rehab pups fed solely on Pet-Ag multimilk-based Diet until release after 5–6 weeks in rehab.
The conclusion from tracking 10 pups was that they seemed to range in the same areas as wild pups tracked earlier, and to develop normal foraging dive behaviour.
Dive times of TSR ‘fast-track’ rehab pups

A. PERIOD 2
Aug 11 – Sep 01

B. PERIOD 3
Sep 02 - 23
Socialisation

Social contact of pups of nursing and post-weaning age

time spent:  sleeping
active
in water/at water’s edge
in contact in water/at water’s edge
< 1ABL/PBL apart onshore/dry area

Record activity budget with CCTV and video (captive bred/rehab) and video (wild) QUANTIFY DIFFERENCES, also differences in QUALITY of behaviour
Harbour seal pup social environment in the wild....

Most affiliative behaviour takes place in the water or at the water’s edge.
....and in rehab

Is this OK?

Typical of 1st few weeks for orphan pups in rehab in many/most facilities in UK and Ireland
Or would they like a companion to sleep with....?
............. and play with (and water to play in)?
<table>
<thead>
<tr>
<th>Year</th>
<th>Pairs</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>Tara* &amp; Caelan</td>
<td>F/M</td>
</tr>
<tr>
<td>2000</td>
<td>Finn &amp; Tinkerbell</td>
<td>M/F</td>
</tr>
<tr>
<td>2001</td>
<td>Rona and Star</td>
<td>F/F</td>
</tr>
<tr>
<td>2002</td>
<td>Evie* &amp; Olly</td>
<td>F/M</td>
</tr>
<tr>
<td>2005</td>
<td>Emil* &amp; Silver</td>
<td>M/M</td>
</tr>
<tr>
<td>2008</td>
<td>Piccolo &amp; Celeste</td>
<td>M/F</td>
</tr>
<tr>
<td>2013</td>
<td>Maxi &amp; Mini</td>
<td>M/F</td>
</tr>
</tbody>
</table>

Since 1997 at TSR – 7 ‘pairs’ of orphan Pups in rehab

ALL 7 pairs have behaved like ‘conjoined twins’ -

ALWAYS sleeping together
playing together
following

Behaviour resembles pup with mother

Behaviour not quantified using CCTV until 2012-13

*Indicates pup was alone with human carer for at least a week before 2nd pup arrived
CCTV also used in 2013 to record behaviour of pups at Friedrichskoog, kept socially with water access from first entry.
Also CCTV record of 2 captive-born pups in 2012
BUT

‘How much’ does a pup want a companion?

is this essential?

‘Demand’ tests

These are tests where an animal is asked to expend effort to gain access to a resource

The effort may (theoretically) be measured quantitatively
Demand test series with two cohabiting pups – Mablethorpe 2012

Increasing weights on gate on successive days of test
An ‘accidental’ demand test!! The celebrated case of ‘Laurel’s quest to see Togo’ at St Andrew’s aquarium

Togo – newly arrived yearling

4 ft metal fence

Laurel – 21-year old female
What are the potential consequences of keeping pups in isolation throughout the natural nursing period?
Two pups raised in isolation until ~4 weeks of age and then allowed to meet were unable to engage in normal social interaction.

They initially approached – but then rejected one another, and subsequently avoided contact.
Consequences of social isolation of orphan Pv pups?

Studies in rhesus monkeys and rats have demonstrated that early social and/or maternal deprivation can result in:

• increased dopamine activity in the pathway basal ganglia>cerebral cortex

• ?chronic stress during rehab (studies underway from faecal and urine analysis)

• increased GC response to stressors into adult life

• levels of maternal contact in rats influence - via epigenetic oxytocin receptor gene expression - the maternal behaviour of female offspring.

Therefore deprivation of social contact in female pups may lead to those pups later displaying deficient maternal behaviour themselves - so could effects of isolating female pups in rehab be passed through to problems with the next generation?

(Martin et al 1991; Robbins et al 1996; Meaney 2001; Meaney & Szyf 2006)
Surrogate contact where necessary for single pups

Studies have shown that daily handling of isolated infant rats may be able to mitigate at least some of the negative effects of isolation (Gentsch et al 1988; Holson et al 1991; Rebouças & Schmidek, 1999).
Thank you