



Evaluation of the performance of in-calf dairy heifers either housed or out-wintered on forage brassicas (stubble turnips)

Simon Marsh , Paul Billington, Carole Brizuela & Scott Kirby

Harper Adams University College

Introduction & Objective

- **There is increased interest in out-wintering systems which have the potential to:**
 - **reduce fixed costs**
 - **allow for increased herd size**
 - **increase farm profitability**
- **There is a paucity of information on out-wintering systems for replacement dairy heifers that need to grow at 0.7-0.85 kg DLWG**
- **The objective of this experiment was therefore to evaluate the performance of replacement dairy heifers either housed or out-wintered on forage brassicas (stubble turnips).**

Materials & Method

- **Twenty eight in-calf Holstein heifers weighing 478kg with a mean age of 21.8 months were either housed or out-wintered.**
- **The out-wintered heifers on stubble turnips were initially offered *ad libitum* straw however this was replaced with haylage (10.6 ME MJ/kg DM) after 48 days. Mineral blocks (Rumenco Cattle Plus TABs) were offered for free access feeding.**
- **Housed heifers fed *ad libitum* grass silage (11.1 ME MJ/kg DM) and whole crop (10.3 ME MJ/kg DM). They were initially fed 1.5kg/concentrates/day. This was replaced with 100g of minerals after 48 days.**

Results

Animal performance - DLWG

DLWG (kg)	Housed	Out-wintered	Sig
Start - 48 days	0.77	-0.30	***

- **Out-wintered heifers offered *ad lib* straw + minerals.**
- **Housed heifers fed *ad lib* grass silage:whole crop plus 1.5kg concs.**

Results

Animal performance - DLWG

DLWG (kg)	Housed	Out-wintered	Sig
Start - 48 days	0.77	-0.30	***
48 days - turnout	0.90	1.37	***
Start - turnout (120 d)	0.85	0.70	*

- **Straw replaced with good quality haylage (10.6 ME) for the out-wintered heifers.**
- **1.5kg concentrates replaced with 100g minerals after 48 days for the housed heifers**

Results

Animal performance - DLWG

DLWG (kg)	Housed	Out-wintered	Sig
Start - 48 days	0.77	-0.30	***
48 days - turnout	0.90	1.37	***
Start - turnout (120 d)	0.85	0.70	*
Turnout - 34 days	0.19	1.08	***

- Heifers turned out on the 20th of March 2008 and both groups the same PRG pasture

Results

Animal performance - DLWG

DLWG (kg)	Housed	Out-wintered	Sig
Start - 48 days	0.77	-0.30	***
48 days - turnout	0.90	1.37	***
Start - turnout (120d)	0.85	0.70	*
Turnout - 34 days	0.19	1.08	***
Turnout - finish (103d)	0.78	1.08	***
Start - finish	0.82	0.88	NS

- Heifers turned out on the 20th of March 2008 and both groups the same PRG pasture
- No significant difference in overall DLWG

Results

Animal performance – Live weight

Liveweight (kg)	Housed	Out-wintered	Sig
Start	476.6	476.4	NS
Turnout	578.1	560.4	NS
Finish	658.6	672.1	NS

- **There were no significant differences in locomotion or dirtiness score or condition score**
- **Overall (winter + summer) fixed and variable costs per kg gain were almost halved with out-wintering (£0.78 v £1.50/kg).**

Results

Animal performance – Feed intakes

- **Silage dry matter intakes of 10.2kg/d were recorded for the housed heifers.**
- **Estimated intakes of stubble turnips ranged from 37-51kg/h/d (4.2-5.8kg DM/h/d) plus 7.5kg/h/d (6.2kg DM) of haylage and 90g/h/d of mineral block.**
- **Utilisation of the stubble turnips was estimated at 38-44%. The majority of the stubble turnips left ungrazed were the roots with the heifers having a preference to eat the leaves. It was estimated that utilisation of the leaves was 90%.**
- **In this study 0.75ha provided sufficient stubble turnips for 1 heifer for 120 days.**



Conclusions

- **Target DLWGs of 0.7-0.8kg to achieve 2 year calving can be achieved with out-wintering systems based on stubble turnips AND haylage/silage on a low cost extensive system.**
- **Out-wintered heifers do not suffer a growth check when moved onto a grass sward in the spring.**
- **There were no welfare implications for the out-wintered heifers.**
- **Overall fixed and variable costs were almost halved with the out-wintered heifers**

Farmer Recommendations

- Offer good quality haylage/silage *ad libitum*. Do not feed straw. Bales should be placed across the field before grazing to minimise soil structure damage.
- Offer mineral blocks.
- Weigh record on a monthly basis to monitor performance.
- Allow 1 hectare of stubble turnips per heifer for a 160 day winter.
- In the study the stubble turnips were established using minimal cultivation techniques and sown with a 12m headland run back area. Consider either a zero or 6m run back area.

Farmer Recommendations

- **Be prepared to accept relatively low stubble turnip utilisation rates of 35-45%, especially from the roots. Increasing utilisation rates may restrict DMI and DLWG. Roots could subsequently be grazed by sheep.**
- **Out-wintering will significantly reduce fixed costs. Buildings could be released for herd expansion or an alternative enterprise.**



Acknowledgement

Funding from DairyCo is gratefully acknowledged.

Support from British Seed Houses, Rumenco Ltd and Rappa Fencing Ltd is also appreciated.

