### Farm Business Management Reports

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#### A Worksheet for Analyzing the Economics of Bovine Somatotropin Adoption

Gayle S. Willett  
Ruth Blauwiekel  
David C. Grusenmeyer  
Herbert R. Hinman

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COOPERATIVE EXTENSION  
Washington State University
PREFACE

This bulletin is intended to help dairy farmers and their advisors analyze the economic impact of bovine somatotropin (BST) on the individual dairy farm. No attempt is made to determine how the dairy industry will be affected by BST. The authors neither support nor oppose the use of BST. Although reference is made to a trade name, no endorsement is intended.
A WORKSHEET FOR ANALYZING THE ECONOMICS OF BOVINE SOMATOTROPIN ADOPTION

by
Gayle S. Willett, Ruth Blauwiekel, David C. Grusenmeyer, and Herbert R. Hinman

INTRODUCTION

Bovine somatotropin (BST) is a naturally-occurring protein produced in the pituitary glands of cattle. It has been known for over 50 years that supplementing the BST of lactating dairy cows increases milk production. Recent biotechnology research has made it possible to produce commercial quantities of BST at a relatively low cost. On November 5, 1993, the Food and Drug Administration approved the first commercial BST product, Posilac®, developed by Monsanto. Sales of this product were initiated in early February 1994. A producer’s decision about the use of BST will depend on the position of their marketing agency, personal preference, and expected economic benefits.

Although some dairy cooperatives have adopted moratoriums on the use of BST to gauge consumer reaction to milk produced by cows supplemented with BST, most producers will have an opportunity in 1994 and subsequent years to decide whether to use BST. Given the highly competitive nature of the milk production business, these decisions will be based primarily on economics. Thus, the producer will want to address such questions as: (1) How much will milk production and associated revenues increase if I adopt BST? (2) How much will it cost to use BST? (3) Given the added revenues and costs, will adoption be profitable? and (4) What are the financial risks associated with BST adoption?

The objective of this publication is to provide producers and/or their advisors a worksheet that will estimate the economic impact of BST adoption by analyzing the above four questions. For those desiring a computer analysis, a computer program (called BST) for IBM or IBM-compatible machines is also available. A brief description of the program and an order form appears in the Appendix.

WORKSHEET ANALYSIS

The accompanying worksheet requests the information and indicates the calculations needed to analyze the economics and risks of BST adoption. Its use will be illustrated by an example.

*Respectively, the authors are extension economist, Department of Agricultural Economics, extension dairy specialist, Department of Animal Science, extension dairy agent, Whatcom County, and extension economist, Department of Agricultural Economics, Washington State University.
The example is used only to illustrate the analysis procedure and should not be interpreted as a recommendation either for or against the use of BST.

Example

H.O. Stein owns and operates a 200-cow dairy. The herd has a 365-day rolling herd average of 22,450 pounds of 3.5% fat milk. If profitable, BST treatments would be initiated on cows 64 days postpartum and administered at 14-day intervals until the lactation is terminated. The ration is comprised of farm-produced silage and purchased alfalfa hay and concentrate.

H.O. Stein is prepared to adopt BST only if it is profitable and has acceptable financial risk. Completion of the following worksheet will provide a reasonable estimate of BST’s economic impact. The worksheet has been completed on a per-cow basis and reflects the benefits and costs of BST use over the entire supplement period (i.e., day 64 through day 305 of the lactation).

Added Revenue

Lines 1-5 compute the added revenue realized from the use of BST. Start the revenue analysis by entering on line 1 the number of days the cow will receive the BST supplement. Assuming a 305-day average lactation period for the example herd and treatment initiated on the 64th day postpartum, the BST supplement period is 242 days (line 1).

The average increase in daily pounds of milk production per cow resulting from BST use should be estimated and entered on line 2. The production response will depend on numerous factors, including the nutrition program, herd health, cow comfort, and most fundamentally, the management skills of the producer. A review of the research suggests daily milk production will generally increase by 8 to 12 pounds per day [1, 2]. A response of 10 pounds is a reasonable estimate for the H.O. Stein Dairy. Line 3 converts the daily response to hundredweight (cwt) of increased milk production realized over the entire 242-day supplement period (= 24.2 cwt for H.O. Stein).

Next, to place a value on the added milk production, it is necessary to estimate the average milk price for the supplement period and enter that figure on line 4. The price should be a gross figure, i.e., it should not be adjusted to reflect marketing costs and assessments. These adjustments will be introduced later in the analysis.

The added revenue from increased milk production is obtained on line 5 by multiplying the production response (line 3) times the gross milk price (line 4). As indicated, H.O. Stein projects the added revenue to be $284.35 per treated cow for the 242-day supplement period.

Added Costs

The added costs associated with realizing the added revenue are estimated on lines 6-10 of the worksheet. One of the major cost items is the purchase of BST. The material (14-day prolonged release) will be introduced into the cow by a series of injections every 14 days. The number of injections is computed on line 6A by dividing the number of days in the supplement
WORKSHEET: ECONOMIC ANALYSIS OF BST ADOPTION.

**ADDED REVENUE ($/Cow/Supplement Period)**
1. Number of days per lactation the cow is supplemented with BST ................ 242
2. Increase in average daily milk production per cow supplemented with BST 10 lbs.
3. Added milk production for BST supplement period (line 1 x line 2 ÷ 100) 24.2 cwt.
4. Gross milk price per cwt. ....................................... $ 11.75
5. Added revenue per cow receiving BST (line 3 x line 4) ................................... $ 284.35

**ADDED COSTS ($/Cow/Supplement Period)**
6. BST cost:
   A. Number of BST doses during supplement period (line 1 ÷ 14 days per dose) ................ 17
   B. Cost per BST dose .......................................... $ 1.60
   C. BST cost per cow for supplement period (line 6A x line 6B) .................................. $ 11.20
7. Labor to administer BST:
   A. Minutes required to identify and inject cow one time ................................. 1
   B. Wage rate ($ per hour) ....................................... $ 10.00
   C. Labor cost (line 6A x line 7A + 60 x line 7B) ............................................ $ 8.83
8. Feed cost:
   A. Added lbs. of milk production during BST supplement period (line 3 x 100) ............ 2.420
   B. Added lbs. TDN to support added milk production (30/lb. TDN/lb. milk x line 8A) .......... 72.9
   C. Feed cost per lb. TDN ........................................ $ 0.123
   D. Added feed cost (line 8B x line 8C) ................................................ $ 8.97
9. Milk hauling, marketing, and assessments ($0.00/cwt. x line 3) ............................ $ 14.53
10. Other added costs (vet., medicine, power, etc.) ........................................... $ 5.00

**ADDED NET INCOME (LOSS)**
11. Added revenue (line 5) ................................................ $ 284.35
12. Added costs (line 6C + line 7C + line 8D + line 9 + line 10) ............................. $ 223.49
13. Added net income per cow during treatment period (line 11 - line 12) .................. $ 60.86

**BREAKEVEN ANALYSIS**
14. Breakeven increase in daily milk production from BST:
   A. Line 1 x (line 4 ÷ 100) ........................................... $ 284.35
   B. Line 12 - line 6C - line 7C - line 10 ................................................. $ 102.46
   C. Line 14B + line 8A ........................................... $ 0.043
   D. Line 1 x line 14C ........................................... $ 10.406
   E. Line 6C + line 7C + line 10 ........................................... $ 120.03
   F. Breakeven increase in daily milk production per [line 14E ÷ (line 14A - line 14D)] .... 2.46 lbs
15. Breakeven milk price per cwt. (line 12 ÷ line 3) ........................................... $ 9.24

1 The lbs. of TDN required to produce 1 lb. of milk varies depending on the milk fat % as follows: 3.5% = .301 lb., 4.0% = .322 lb., 4.5% = .343 lb.
2 Should be interpreted as return to management and risk.
3 Assumes all other variables have the values used above. If production response exceeds this value, BST will increase net income. A lower value implies BST will decrease net income.
4 Assumes all other variables have the values used above, including the production response on line 2. If the milk price received for the added milk production exceeds this value, BST will increase net income for your dairy. A lower price will result in reduced net income.
period (line 1) by 14. Seventeen injections over the 242-day supplement period are planned by H.O. Stein. The per dose (or injection) cost should be entered on line 6B ($6.60). Line 6C computes the total cost of the BST material for the supplement period by multiplying the number of doses (line 6A) times the cost per dose (line 6B). As indicated, that cost is $112.20 per cow for the example.

Additional labor will be required to identify, perhaps segregate, and inject cows. The time needed to perform these functions will vary with several factors including the system used to identify cows for supplementation, how cows are secured (e.g., parlor, stalls, lock-up stanchions, chutes), and skill in administering the injection. An estimate of the labor in minutes required to identify, secure, and inject the cow per treatment should be entered on line 7A. The wage rate in $ per hour is entered on line 7B. In the event hired labor is used, the figure should include the wage, industrial insurance, social security, health insurance, and other perquisites.

Even though full-time hired labor may be used and no additional wages paid, other productive uses of labor will often be sacrificed to inject cows, thereby justifying the allocation of labor costs to the BST injection. Also, unpaid operator labor should be valued at the rate the operator places on the time given up to perform the BST injection. H.O. Stein estimates it will cost about $2.83 per cow for the labor to administer BST during the 242-day supplement period (line 7C). That estimate is based on one minute per injection (line 7A), 17 injections per cow (line 6A), and labor valued at $10 per hour (line 7B).

If the manager of a BST supplement program intends to get full benefit of the production response, the dry matter intake of supplemented cows must also increase. The cost of the added feed intake is computed on lines 8A-8D. According to the National Research Council, it takes .301 pound of TDN to produce one pound of 3.5% fat milk [3]. Multiplication of this factor times the additional pounds of milk production (line 8A) determines the additional TDN requirement, expressed in pounds (line 8B). Next, the feed used to provide the additional dry matter must be identified and the cost per pound of TDN determined (line 8C). To determine this cost, identify the source of additional TDN (e.g., concentrate, total mixed ration, etc.) and then divide the cost of the feed per ton by the pounds of TDN contained in one ton of the feed. The added feed cost can then be computed on line 8D by multiplying the additional pounds of TDN (line 8B) times the TDN cost per pound (line 8C). H.O. Stein projects an added feed cost of $88.94 per cow during the 242-day supplement period. This estimate assumes the 729 pounds of added TDN (= 2,420 pounds added milk production x .301) will be supplied by concentrate containing 80% TDN on a dry matter basis. The concentrate costs $180 per ton (92% dry matter); thus, the cost per pound of TDN = $180 ÷ [2,000 x .92 x .80], or $0.122 (line 8C). Multiplication of the $0.122 cost per pound of TDN times the 729 pounds of TDN yields the $88.94 added feed cost per cow.

Added milk production will also increase various marketing costs, including transportation, promotional fees and government assessments. These costs can be estimated on line 9 by first expressing them on a per cwt basis and then multiplying times the added cwt of production (line 3). For the example dairy, these fees amounted to $0.60 per cwt (including the 11 1/4 per cwt. Commodity Credit Corporation assessment under the 1990 Omnibus Reconciliation Act). Since BST is projected to increase milk production by 24.2 cwt per cow (line 3), added marketing costs are estimated to be 24.2 cwt x $0.60, or $14.52 (line 9).
Due to increased milk production and the associated stress, cows supplemented with BST may require additional health care. Also, additional power may be needed to extract the milk, transport it from cow to storage, and cool it. These costs, estimated to be $5.00 per cow for H.O. Stein, should be entered on line 10.

**Added Net Income (Loss)**

The added revenues, added costs, and resulting change in net income are reported on lines 11, 12, and 13, respectively. As indicated on the worksheet, H.O. Stein projects the use of BST will increase per supplemented cow revenue by $284.35. Expenses are expected to rise by $223.49, resulting in an increase in net income of $60.86 per cow over the 242-day supplement period. The $60.86 should be interpreted as compensation to H.O. Stein's BST program management contribution and assumption of the associated risks. If the compensation is sufficient and economics is the primary decision criteria, BST will likely be used by H.O. Stein.

**Financial Risk Analysis**

The worksheet analysis conducted thus far should be based on the best estimate of what will happen if BST is adopted. However, it is very likely that several of the assumptions underlying the analysis may, in fact, turn out to be quite different from what was anticipated. The difficulty in accurately predicting the future introduces an element of risk into the decision about the use of BST. Risk and the variability of economic impacts is a particular concern for such key variables as the production response and milk price. Two techniques can be used to gain a better understanding of the risks. These techniques are referred to as sensitivity and breakeven analyses.

**Sensitivity Analysis**

A sensitivity analysis calculates the change in net income associated with different values for key, yet uncertain, variables. The sensitivity of net income associated with varying milk price and production response for the example dairy is reported in the table below. This information was developed by completing several worksheets using different milk prices and production responses.

<table>
<thead>
<tr>
<th>Production Response (lbs./cow/day)</th>
<th>Price of Milk ($ per cwt)</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>($ Per Cow)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-36.87</td>
<td>-22.33</td>
<td>-7.83</td>
<td>6.69</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>-9.14</td>
<td>10.22</td>
<td>29.58</td>
<td>48.94</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>18.58</td>
<td>42.78</td>
<td>66.98</td>
<td>91.18</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>46.30</td>
<td>75.34</td>
<td>104.38</td>
<td>133.42</td>
<td></td>
</tr>
</tbody>
</table>

1 All other assumptions are unchanged from the base analysis (see completed worksheet).
As indicated in the table, assuming a daily increase in milk production of six pounds per cow and a $10 milk price, the use of BST is estimated to reduce net income by $36.87 per cow. In contrast, a 12-pound increase in milk production, coupled with a $13 milk price, increases net income by $133.42 per cow. This variation in net income reflects the importance of the production response and milk price in determining the profitability of BST adoption.

Breakeven Analysis

Another technique for analyzing the risk associated with the adoption of BST is to calculate the value of an important, yet uncertain, variable that results in no change in net income. Stated alternatively, we could calculate the production response or the milk price at which the producer experiences no change in net income and is therefore, indifferent about BST adoption. Once the breakeven value is determined, the dairy farmer must only decide whether the value of the uncertain variable is likely to be greater than or less than the breakeven figure to draw a conclusion about the profitability of BST.

A calculation for the breakeven increase in daily milk production per cow appears on the worksheet, lines 14A-14F. As indicated on line 14F, if the example producer experiences a daily BST milk production response of 6.7 pounds per cow, the added revenues from BST adoption equal the added costs, resulting in no change in net income. This calculation assumes all other revenue and cost variables retain their originally adopted values. If the production response is expected to exceed 6.7 pounds, BST adoption should be profitable. A lower response implies BST will be unprofitable.

The breakeven milk price is calculated on line 15 of the worksheet. It is computed by dividing the added costs of BST use by the added milk production. H.O. Stein's analysis indicates a breakeven milk price of $9.24 per cwt. Thus, assuming all other variables retain their original values (including a 10-pound production response), BST adoption is profitable if the milk price exceeds $9.24, and unprofitable at a lower price.

CONCLUSION

The objective of this publication has been to present a worksheet dairy farmers and/or their advisors can use to analyze the economics of BST adoption. An example dairy was used to illustrate the use of the worksheet. The example analysis should not be interpreted as a recommendation for or against the adoption of BST. Due to variation between dairy farmers in resource situations, goals, and in the ability to manage nutrition and other stresses associated with higher producing cows, it is inadvisable to make blanket recommendations. Instead, each producer contemplating the use of BST is encouraged to set aside a few minutes to gather the essential information and conduct a financial analysis like that suggested by this bulletin. Decisions based on the best available data and a thorough financial analysis of that data will be superior to those driven by hunches or someone else's recommendation.
## WORKSHEET: ECONOMIC ANALYSIS OF BST ADOPTION.

### ADDED REVENUE ($/Cow/Supplement Period)
1. Number of days per lactation the cow is **supplemented with BST**
2. Increase in average daily milk production per cow supplemented with BST
3. *Added milk production for BST supplement period* (line 1 x line 2 ÷ 100)
4. Gross milk price per cwt.
5. *Added revenue per cow receiving BST* (line 3 x line 4)

### ADDED COSTS ($/Cow/Supplement Period)
6. BST cost:
   - Number of BST doses during supplement period (line 1 ÷ ___ days per dose)
   - Cost per BST dose
   - BST cost per cow for supplement period (line 6A x line 6B)
7. Labor to administer BST:
   - Minutes required to identify and inject cow one time
   - Wage rate ($ per hour)
   - Labor cost (line 6A x line 7A ÷ 60 x line 7B)
8. Feed cost:
   - Added lbs. of milk production during BST supplement period (line 3 x 100)
   - Added lbs. TDN to support added milk production (___ lb. TDN/lb. milk x line 8A)
   - Feed cost per lb. TDN
   - Added feed cost (line 8B x line 8C)
9. Milk hauling, marketing, and assessments ($ ___/cwt. x line 3)
10. Other added costs (vet., medicine, power, etc.)

### ADDED NET INCOME (LOSS)
11. Added revenue (line 5)
12. Added costs (line 6C + line 7C + line 8D + line 9 + line 10)
13. Added net income per cow during treatment period (line 11 - line 12)

### BREAKEVEN ANALYSIS
14. Breakeven increase in daily milk production from BST:
   - Line 1 x (line 4 ÷ 100)
   - Line 12 - line 6C - line 7C - line 10
   - Line 14B + line 8A
   - Line 1 x line 14C
   - Line 6C + line 7C + line 10
   - Breakeven increase in daily milk production per cow [line 14E ÷ (line 14A - line 14D)]
15. Breakeven milk price per cwt. (line 12 ÷ line 3)

---

1 The lbs. of TDN required to produce 1 lb. of milk varies depending on the milk fat % as follows: 3.5% = .301 lb., 4.0% = .322 lb., 4.5% = .343 lb.
2 Should be interpreted as return to management and risk.
3 Assumes all other variables have the values used above. If production response exceeds this value, BST will improve net income. A lower value implies BST will decrease net income.
4 Assumes all other variables have the values used above, including the production response on line 2. If the milk price received for the added milk production exceeds this value, BST will increase net income for your dairy. A lower price will result in reduced net income.
REFERENCES


APPENDIX

Description and Operating Instructions for

BST

Version 1.0

A computer program for analyzing the economics of BST adoption in dairy herds.
MICROCOMPUTER PROGRAM

To adequately analyze the economics of BST adoption, several analyses should be made to test its sensitivity to changing assumptions. Since considerable time and effort is required to manually complete several worksheets, a computer program may be attractive to many users.

The BST microcomputer program was developed as a Quattro Pro 4.0 template and then compiled into a stand-alone computer program using Baler 6.0. User instructions for the BST microcomputer program follow. A certain minimum knowledge of spreadsheet design and data entry is assumed. The preceding example illustrates the features of the program.

Program Operation

The BST microcomputer program can be activated from any program drive. It is recommended, however, that the program be installed on your hard drive and initiated from the specified directory on the hard drive. Assuming the specified directory on the hard drive containing the BST program is named BSTPROG, open the BSTPROG directory and type BST after the C:\BSTPROG> prompt and press <ENTER>. The following title screen will appear (Figure 1):

WASHINGTON STATE UNIVERSITY
Cooperative Extension

PRESENTS

BST
Version 1.0

A computer program for analyzing the economics of BST adoption in dairy herds.

DEVELOPED BY

Gayle Willett, Extension Economist, Department of Agricultural Economics
Ruth Blauwiekel, Extension Dairy Specialist, Department of Animal Sciences
David Grusenmeyer, Extension Dairy Agent, Whatcom County
Herbert Hinman, Extension Economist, Department of Agricultural Economics

Press any key to continue...

509-335-2882

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Figure 1. BST title screen.
At this point the user can move to the menu screen by pressing any key. The following menu screen will appear (Figure 2):

![Figure 2. BST menu screen.](image)

This menu screen lists five alternatives that may be selected. By pressing Alt-B, the computer worksheet, Figure 3, for analyzing the economics of BST adoption in dairy herds, appears.

The unshaded data entries, which currently contain zeros, must be entered by the user. The shaded cells are automatically calculated by the program. Figure 4 displays example output as entered and calculated by the computer program.

**Note:** If the user desires to load the example data without manually entering it, perform the following keystrokes:

```
/File
Get
```

Place the cursor over the file named BSTX.WKB and press `<ENTER>`.

By returning to the MAIN MENU (press `<HOME>`), the user can see that the resulting output from the BST economic analysis can be printed by pressing Alt-P. However, before printing, the user must be sure the printed page length is set correctly for the type of printer being used. Press Alt-D to set the page length for the dot matrix printer or Alt-L to set the page length for the laser printer.
## ECONOMIC ANALYSIS OF BST ADOPTION

<table>
<thead>
<tr>
<th>Item</th>
<th>Your Dairy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADDED REVENUE ($/Cow/Supplement Period)</strong></td>
<td></td>
</tr>
<tr>
<td>1. Number of days per lactation the cow is supplemented with BST</td>
<td>0.00</td>
</tr>
<tr>
<td>2. Increase in average daily milk production per cow supplemented with BST</td>
<td>0.00</td>
</tr>
<tr>
<td>3. Added cwt. of milk production for BST supplement period</td>
<td>0.00</td>
</tr>
<tr>
<td>4. Gross milk price ($ per cwt.)</td>
<td>$0.00</td>
</tr>
<tr>
<td>5. Added revenue per cow receiving BST</td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>ADDED COSTS ($/Cow/Supplement Period)</strong></td>
<td></td>
</tr>
<tr>
<td>6. BST cost:</td>
<td></td>
</tr>
<tr>
<td>A. Number of days between BST doses</td>
<td>0.00</td>
</tr>
<tr>
<td>B. Number of BST doses during supplement period</td>
<td>0.00</td>
</tr>
<tr>
<td>C. Cost per BST dose</td>
<td>0.00</td>
</tr>
<tr>
<td>D. BST cost per cow for supplement period</td>
<td>$0.00</td>
</tr>
<tr>
<td>7. Labor to administer BST:</td>
<td></td>
</tr>
<tr>
<td>A. Minutes required to identify and inject cow one time</td>
<td>0.00</td>
</tr>
<tr>
<td>B. Wage rate ($ per hour)</td>
<td>$0.00</td>
</tr>
<tr>
<td>C. Labor cost</td>
<td>$0.00</td>
</tr>
<tr>
<td>8. Feed cost:</td>
<td></td>
</tr>
<tr>
<td>A. Lbs. of TDN needed to support one lb. of milk production (see note at bottom of spreadsheet)</td>
<td>0.000</td>
</tr>
<tr>
<td>B. Added lbs. of TDN to support added milk production</td>
<td>0.00</td>
</tr>
<tr>
<td>C. Feed cost per lb. TDN</td>
<td>$0.00</td>
</tr>
<tr>
<td>D. Added feed cost</td>
<td>$0.00</td>
</tr>
<tr>
<td>9. Milk hauling, marketing, and assessments:</td>
<td></td>
</tr>
<tr>
<td>A. Added hauling, marketing, and assessment cost per cwt. of milk</td>
<td>$0.00</td>
</tr>
<tr>
<td>B. Total added hauling, marketing, and assessment cost for BST supplement period</td>
<td>$0.00</td>
</tr>
<tr>
<td>10. Other added costs (vet., medicine, power, etc.)</td>
<td>$0.00</td>
</tr>
<tr>
<td>11. Total added cost per cow receiving BST</td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>ADDED NET INCOME (LOSS)</strong></td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>BREAKEVEN ANALYSIS</strong></td>
<td></td>
</tr>
<tr>
<td>12. Breakeven increase in daily lbs. of milk production per cow receiving BST</td>
<td>0.00</td>
</tr>
<tr>
<td>13. Breakeven milk price</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

Note: The lbs. of TDN required to produce one lb. of milk varies depending on the milk fat % as follows: 3.5% = .301 lbs., 4.0% = .322 lbs., 4.5% = .343 lbs.

Figure 3. Computer worksheet for analyzing the economics of BST adoption in dairy herds.
## ECONOMIC ANALYSIS OF BST ADOPTION

**ADDED REVENUE ($/Cow/Supplement Period)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Your Dairy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of days per lactation the cow is supplemented with BST</td>
<td>242.00</td>
</tr>
<tr>
<td>2. Increase in average daily milk production per cow supplemented with BST</td>
<td>10.00</td>
</tr>
<tr>
<td>3. Added cwt. of milk production for BST supplement period</td>
<td>24.20</td>
</tr>
<tr>
<td>4. Gross milk price ($ per cwt.)</td>
<td>11.75</td>
</tr>
<tr>
<td>5. Added revenue per cow receiving BST</td>
<td>284.35</td>
</tr>
</tbody>
</table>

**ADDED COSTS ($/Cow/Supplement Period)**

<table>
<thead>
<tr>
<th>Item</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6. BST cost:</td>
<td></td>
</tr>
<tr>
<td>A. Number of days between BST doses</td>
<td>14.00</td>
</tr>
<tr>
<td>B. Number of BST doses during supplement period</td>
<td>17.00</td>
</tr>
<tr>
<td>C. Cost per BST dose</td>
<td>6.60</td>
</tr>
<tr>
<td>D. BST cost per cow for supplement period</td>
<td>112.20</td>
</tr>
<tr>
<td>7. Labor to administer BST:</td>
<td></td>
</tr>
<tr>
<td>A. Minutes required to identify and inject cow one time</td>
<td>1.00</td>
</tr>
<tr>
<td>B. Wage rate ($ per hour)</td>
<td>10.00</td>
</tr>
<tr>
<td>C. Labor cost</td>
<td>2.83</td>
</tr>
<tr>
<td>8. Feed cost:</td>
<td></td>
</tr>
<tr>
<td>A. Lbs. of TDN needed to support one lb. of milk production (see note at bottom of spreadsheet)</td>
<td>0.301</td>
</tr>
<tr>
<td>B. Added lbs. of TDN to support added milk production</td>
<td>728.42</td>
</tr>
<tr>
<td>C. Feed cost per lb. TDN</td>
<td>0.122</td>
</tr>
<tr>
<td>D. Added feed cost</td>
<td>88.87</td>
</tr>
<tr>
<td>9. Milk hauling, marketing, and assessments:</td>
<td></td>
</tr>
<tr>
<td>A. Added hauling, marketing, and assessment cost per cwt. of milk</td>
<td>0.60</td>
</tr>
<tr>
<td>B. Total added hauling, marketing, and assessment cost for BST supplement period</td>
<td>14.52</td>
</tr>
<tr>
<td>10. Other added costs (vet., medicine, power, etc.)</td>
<td>5.00</td>
</tr>
<tr>
<td>11. Total added cost per cow receiving BST</td>
<td>223.42</td>
</tr>
</tbody>
</table>

**ADDED NET INCOME (LOSS)**

| Amount                                                               | 60.93      |

**BREAKEVEN ANALYSIS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Breakeven increase in daily lbs. of milk production per cow receiving BST</td>
<td>6.63</td>
</tr>
<tr>
<td>13. Breakeven milk price</td>
<td>9.23</td>
</tr>
</tbody>
</table>

Note: The lbs. of TDN required to produce one lb. of milk varies depending on the milk fat % as follows: 3.5% = .301 lbs., 4.0% = .322 lbs., 4.5% = .343 lbs.

**Figure 4.** Example computer worksheet analysis of the economics of BST adoption in dairy herds.
The data file can be saved by following the below listed spreadsheet commands:

```
/File
Save
```

At this point the user lists the disk drive, the directory, and the file name under which the data file is to be saved. For example, if the data file is to be saved on drive A, in a directory named BST, under file name BSTX, the entry would be:

```
A:\BST\BSTX
<ENTER>
```

The data file is saved as BSTX.WKB.

This data file can be retrieved at a later date by entering the BST program and executing the below listed keystrokes:

```
/File
Get
A:\BST\BSTX
<ENTER>
```

At any point in the program, the user can exit the program by pressing Alt-Q.

******************************************************************************************

To order a copy of the BST microcomputer program fill out the order form following, enclose $15.00 and send it to:

Bulletin Office
Cooper Publications Building
Washington State University
Pullman, WA 99164-5912
ORDER FORM

The program is available for IBM-PC/XT/AT, PS/2 or compatible microcomputers.

BST Microcomputer Program MCP0024

| Enclose $15.00 (includes postage and handling) |
| Disk size | 3.5" | 5.25" |

Ship to:

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| Disk size | 3.5&quot; | 5.25&quot; |</p>
<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Zip</th>
</tr>
</thead>
<tbody>
<tr>
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