



**STANDARDIZED PERFORMANCE ANALYSIS
COW-CALF ENTERPRISE PERFORMANCE
MEASURES WORKSHEET (SPA-PCC)***

SPA-1
6-16-06

SPA is a standardized beef cattle enterprise production and financial performance analysis system. The cow-calf and Seedstock SPA Subcommittees of the National Cattlemen's Beef Association (NCBA), in cooperation with the National Integrated Resource Management (IRM) Coordinating Committee, defined this cow-calf enterprise analysis system. SPA facilitates the comparison of an operations performance between years, producers, production regions, and production systems. The analysis is based on fiscal year production and financial data.

Cow-calf SPA includes performance measures for reproduction, production, grazing and raised feed, marketing, and financial and economic performance. SPA is an integrated analysis that links both financial and production performance. Cow-calf producers should do a complete SPA analysis annually.

The purpose of this worksheet is to provide the definitions of terms, along with the forms, necessary to complete the production performance analysis for commercial or seedstock cow-calf (SPA-PCC). In completing this analysis, the user will be able to calculate all of the production performance measures presented in the *Guidelines for Production and Financial Performance Analysis for the Cow-calf Enterprise*.

Users of the cow-calf SPA developed for commercial herd evaluation will note that the production measures selected for the seedstock cow-calf are the same as those recommended for commercial cow-calf. The difference between the two evaluations is in the financial analysis; the allocation of capital investments and the cost associated with the seedstock activity of sale bulls and replacement heifer enterprises.

If the user does not care to perform the calculations manually, this worksheet can also be used to collect the data required by the available computer software (see reference list for sources of the software).

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Completing the Analysis

The following discussion will outline the steps required to complete the production performance analysis. Because this information may not be sufficiently explained, we have included a section entitled, “Description of Terms” beginning on page 5. This section contains a detailed explanation of most of the items included in the worksheet.

Within the description section, as well as the worksheet itself, many of the performance measures are identified as either primary or secondary measures of performance. Primary measures require data that must be provided in order to complete the analysis; however, secondary measures require data that the participant may or may not be able to provide. A single asterisk denotes primary measures of performance while double asterisks denote secondary measures.

The worksheet is organized such that all calculations can be performed manually; however, if the available computer software will be used, the boxed and shaded areas of the worksheet (items which require calculations) can be omitted. The computer software will calculate these boxed areas.

Descriptive and Marketing Data

Lines 1 – 10 require descriptive information regarding the farm or ranch being analyzed. Within this section, lines 8 and 9 require special attention. Line 8 asks for the size of the herd as measured by the number of breeding females. Care must be taken to ensure that this inventory number is taken at the beginning of the fiscal year and that the number includes all breeding females. Breeding cows include all mature females and heifers of breeding age that have the potential to calve and wean a calf during the fiscal year.

Line 9 (a-d) identifies the management or production systems for the particular herd being analyzed. These seasons include breeding, pregnancy testing, calving, and weaning. For consistency, use the mature cow beginning breeding date, even though the beginning breeding date for the heifers may be different. The weaning dates are important because they determine the year that is being analyzed. It is also important to note that because the production cycles overlap, the year in which the calves were weaned will not be the same year in which the females were exposed.

SPA is more accurate and meaningful when the breeding season is controlled to a defined periods and the timing of pregnancy is clear. However, producers with year round breeding seasons using SPA should record the beginning of the breeding season as the first of the fiscal year and the ending at the end of the fiscal year. Caution must be made in identifying calves born and weaned during the fiscal year. Cows calving in the fall in the previous fiscal year of analysis and weaning in the fiscal year are part of production. Those born in the fall of the fiscal year of the analysis are not considered part of the fiscal years’ production.

Lines 11 – 14 are used to determine the number of grazing and raised feed acres of owned and leased land that are used by the cow-calf enterprise. Lines 11 – 12 summarize the owned grazing and raised feed land information; whereas, lines 13 – 14 summarize the leased land data. In either case, the total acres for the farm or ranch are first determined for each forage type. Once this is

done, the actual amount used by the cow-calf enterprise can be calculated. This is accomplished by multiplying the percentage of each forage type that is used by the cow-calf enterprise by the total number of acres for that forage type. Please refer to the “Description of Terms” section for a more detailed explanation of the requirements.

Because owned land can be leased, as opposed to being held for forage production, it is important to identify the opportunity cost of such an action. The lease equivalency and maintenance cost columns allow for the identification of this opportunity cost. In short, the lease equivalency is the annual rate that the owned land could be leased for. The maintenance cost is the additional expense incurred by the owner in maintaining the land suitable for grazing in the event that the land is leased. Both of these costs are reflected on a per acre basis for each of the forage types.

Although this works well for owned grazing acres, raised feed acres must be adjusted for the amount of raised feed actually used by the cow-calf enterprise. Again, refer to the “Description of Terms” section for a more detailed explanation on this area.

Line 15a refers to the market value of raised feed that was fed during the fiscal year. The market value of this feed is determined based upon the value of the raised feed inventory at the beginning of the feeding season. Lines 15a and 15b refer to the amount of raised and purchased feed fed to the breeding females during the fiscal year. This is an either/or situation in which one can enter either the total pounds of raised and purchased feed fed to the breeding females or the average amount fed to the females.

Marketing data and information (lines 17 a – b and d - e) are strictly descriptive rankings of the marketing and pricing methods used beginning with one as the most important. Lines 17 c and f are strictly descriptive describing the breeds of the cattle.

Weaned calf production and values are entered on lines 18 a – d. This includes all weaned calves, whether they are market calves, retained ownership calves, bull calves retained for sale, and bulls or replacement heifer calves. Weights and values should be at the time of weaning. For calves not sold, a value should be assigned based on the current market price and net pay weight at the time of weaning. Be sure to include any calves that were sold or transferred out prior to weaning if not sold in cow-calf pairs.

Lines 19 and 20 are used to determine the value of cull sales for the fiscal year. Culled females, for breeding or for slaughter, are identified in line 19 where the total head, weight, and value are entered. The same information is required of cull bull sales in line 20.

Production and Reproduction Data

One of the principles providing the foundation for this analysis is that exposed females are used to calculate many of the performance measures. Lines 21 – 29 provide a reconciliation of the number of exposed females that adjusts the beginning breeding inventory for transfers of females into and out of the herd. The end result of this section is the determination of the adjusted exposed female number (line 29). It is this number that is used as a denominator in calculating a large

number of the performance measures.

Adjustments to the number of exposed females are divided into three time sections: (1) during breeding, (2) after breeding but before calving, and (3) after calving. Please refer to the “Description of Terms” section for details of what each of the items within these sections should and should not include.

Lines 30 – 32 are used to determine death loss and herd replacement rates. This section is kept separate from the inventory reconciliation of exposed females because the exposed female number should not be adjusted for death loss.

Although pregnancy testing is an important activity, not everyone is able to pregnancy test. Therefore, pregnancy performance measures are secondary measures. In other words, the fact that an operation does not pregnancy test its cattle does not make this analysis null and void. It simply means that the performance measures relating to pregnancy rates will not be available. Lines 33 – 37b relate to pregnancy performance measures.

Lines 38a – 41b are used to determine the calving performance for a particular herd. It is important to note that line 38a includes total female calving with full term calves. Even though a female’s calf was born dead, it still falls into this category if it was a full term calf. Although it is an important bit of information, the calving distribution (line 38c) is not an essential element to this analysis. It can, however, provide valuable information to management regarding reproductive performance.

Lines 42 – 44 pertain to weaning performance. Of these three, total weaned calves (line 43) is the most important. This includes a total head count of all calves weaned during the weaning period.

Materials and Support

For more information regarding the distribution of these materials and/or the software, please contact:

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DESCRIPTION OF TERMS

1. **Producer Code** is the computer file name for your data file. This item should identify (for your purposes) the particular herd you are dealing with.
2. **Fiscal year** corresponds to the accounting or financial operating year of the farm or ranch business. This will be the fiscal year that will be used to prepare the total farm or ranch financial statements. The fiscal year should correspond to the year in which the calves being analyzed were weaned.
3. **Farm or Ranch location** is the state, zip code, county, geographic region that is used to identify specific production areas.
4. **Business description** is the item used to identify the type of business involved in the production of the cattle being analyzed. Included in the description are business organization (e.g., sole proprietorship, partnership, or corporation) and financial accounting method (cash or accrual).
5. **Precipitation (inches)** is the rainfall measurements for the production period being analyzed, and average annual rainfall data are included in the analysis. Comparison of rainfall for the period being analyzed with the average annual rainfall may help identify periods when rainfall abnormally influences productivity. Average rainfall measurements can be used to identify similar production areas across operations.
6. **Type of enterprise** identifies whether the cow-calf enterprise is commercial or seedstock and if the herd calving season is spring, fall, or year-round
7. **Cow-calf enterprise gross revenue as a % of Total Gross Revenue** is a percentage of the total gross revenue, which provides a measure of the importance of the cow-calf enterprise to the total business. This can be an approximate value.
8. **Size of herd – Breeding Cows (hd.)** is the size of the cow-calf enterprise being measured in terms of the number of breeding cows shown on the beginning of the fiscal year balance sheet where breeding cows include all mature females and heifers of breeding age that have the potential to calve and wean a calf during the fiscal year.
9. **Management/production seasons for mature females** is the management or production seasons for the particular herd being analyzed. These seasons include breeding, pregnancy testing, calving, and weaning. It is important to note that because the production cycles overlap, the year in which the calves are weaned will not be the same year in which the females were exposed.
 - 9a. **Breeding season beginning and ending dates** include the starting and ending dates for the breeding season of this production cycle. This date should correspond with the majority of the breeding activity for mature cows in the herd. For consistency, use the mature cow beginning breeding date, even though the breeding date for the heifers may be different.
 - 9b. **Pregnancy testing beginning and ending dates** include the starting and ending dates for the

pregnancy testing season of this production cycle. This date should correspond with the majority of the testing activity for the mature cows in the herd.

9c. Calving season beginning and ending dates include the starting and ending dates for the calving season of this production cycle. This date should correspond with the majority of calving activity for the mature cows in the herd.

9d. Weaning period beginning and ending dates include the starting and ending dates for the weaning season of this production cycle. This date should correspond with the majority of weaning activity for the mature cows in the herd. Note that these dates determine the year that is being analyzed.

10. Dominant grazing method – exposed females describes the predominant grazing method of the exposed females (i.e., continuous or rotational).

11. Grazing acres – cow-calf enterprise definitions of forage terms are defined by the Forage and Grazing Terminology Committee, American Forage and Grassland Council, 1991, as follows:

(a) **Native unimproved (rangeland and meadows)** is land on which the indigenous vegetation is predominantly grass, grass-like plants, forbs or shrubs and is managed as a natural ecosystem.

(b) **Native improved** is land devoted to the production of introduced forages for harvest primarily by grazing; managed as a natural ecosystem.

(c) **Improved perennial** is land devoted to the production of introduced perennial forage for harvest primarily by grazing. Improved perennial pastureland must be managed to arrest successional processes.

(d) **Annual pasture or forage crop** is a crop of cultivated annual plants or plant parts produced to be grazed or harvested for use as feed for animals.

(e) **Woodlands (grazeable forest)** is forestlands that produce, at least periodically, sufficient understory vegetation that can be grazed. Forage is indigenous or, if introduced, it is managed as though it were indigenous.

(f) **Crop aftermath** is the forage remaining on the land as a consequence of harvesting of a crop. At times, crop residues are used for grazing (i.e., rice stubble or corn stubble). To calculate the acreage, multiply the number of acres times the time spent grazing. For example, 100 acres of crop aftermath grazed for two months would yield 16.7 acres ($100 * 2/12 = 16.7$).

Lease equivalent is the annual rate that could be received if the owned grazing land were leased (i.e., opportunity cost or earnings foregone by using the land instead of leasing it). When the economic cost of grazing is calculated, the net lease (discussed below) is added to the financial grazing costs to determine total economic grazing costs.

Lessor cost includes expenses that would be incurred by the landowner (lessor), in the event that the land is leased, to maintain the land in suitable grazing condition. The amount and types of costs included here are dependent on the type of lease agreement that would be signed. Examples of lessor costs include the owner's share of fertilizer expense, weed control expense, and mowing expense. Land tax would also be an expense that most landowners would pay in the event that they leased their land. These expenses should reflect the actual expenses incurred as shown in the financial analysis. When the net lease is calculated, this value is subtracted from the lease equivalence.

Opportunity cost owned grazing land (net lease equivalent) is the difference between the expected lease rate of owned grazing land (lease equivalent) and the costs that would be incurred by the landowner (lessor) in the event that the land is leased. The net lease equivalent figure is added to the financial grazing costs to determine total economic grazing cost.

12. (a – e) Raised feed acres is raised feed land acres (i.e., land for hay production) that must be adjusted of the amount of production or raised feed actually used by the cow-calf enterprise. Consider for example, a situation where the raised feed land (hay pasture) totaled 85 acres and produced 25,000 pounds of hay. Of the total hay production 12,500 pounds of hay is fed, 10,000 pounds sold and the balance, 2,500 pounds is in inventory. Therefore, 50% of the production $[(12,500/25,000) * 100]$ was actually fed to the cow-calf enterprise and the acreage should be adjusted. Total raised feed acres times the percentage of production fed (i.e., $85 * (12,500/25,000) = 42.5$ acres) equals adjusted raised feed land acreage. Silage fed should be converted to a dry air basis (i.e., 6,000 lbs of silage, 60% moisture content, 40% DM or 2,400 pounds DM converts to 2,759 pounds of 13% moisture content, $2,400/0.87$).

13. (a – f) & 14 (a-e) Leased land is the same descriptions and calculations that are utilized for leased as that used with owned land, with the exception that the actual lease expense is not recorded because they will be in the actual financial data.

15a. Raised feed fed is the total pounds (as fed) of raised feed by forage type fed including roughages, complete feed or concentrate, and protein supplement. Include the market value of each raised feed fed by type.

Market value of raised feed fed (valued at the beginning of the feeding season) – This is the market value of the raised feed fed valued at the beginning of the feeding season. This value is the opportunity cost associated with the raised feed activity (i.e., earnings foregone by not selling the raised feed that was fed).

Matching use and costs – Purchased/raised feed cost is often times the actual accrual adjusted raised and purchased feed costs that do not match the weaned calf production cycle for most operations. If there are wide fluctuations in feed prices between years, these costs can be distorted. Feed costs should be identified with a specific fiscal year weaned calf crop, not the production cycle as illustrated in Figure 1.

The financial or fiscal year for most operations includes the end of one winter feeding period (before the calves are born) and the beginning of a second winter feeding period (after the

weaned calves are sold or transferred into a new production activity). It is recommended that accurate accrual accounting values be used as the fiscal year cost for raised and purchased feed. This should take into account the end of one wintering year and the beginning of another wintering year.

The implementation of SPA also requires placing a market value on raised feed fed. This should be done at the beginning of the feeding season for the winter before the calves are weaned. Therefore, the total market value for raised feed fed is the total value based on the market value of the feed at the beginning of the feeding season prior to weaning.

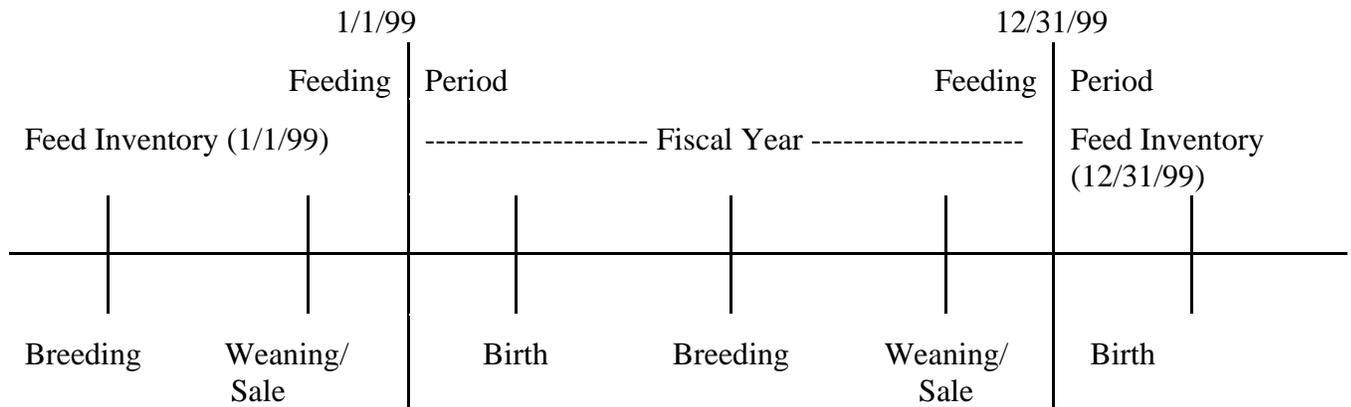


Figure 1. Matching Feeding Costs for Spring Calving Season and Fiscal Year Accounting

In cases of wide variation in feeding costs, it is advisable to use actual costs for the raised feed fed during the winter feeding periods. However, proper adjustments must be made to prevent double accounting during the fiscal year.

Matching of expenses with revenue is challenging in the case of raised feed. Again, consistency between years will lead to the greatest accuracy. The better the feed use records the more accurately costs can be calculated.

15b. Purchased feed fed is the total pounds (as fed) of purchased feed by forage type fed including roughages, complete feed, or concentrate, mineral and salt, and protein supplement.

16. Total pounds of raised/purchased feed fed to breeding cows are the total in pounds of all raised or purchased feed fed during the fiscal year. Include feed fed to all classes of animals within the cow-calf enterprise (i.e., breeding cows, bulls, replacement heifers, calves). Feed fed to sale bulls and replacement heifers for sale should not be included because sale bulls and replacement heifers for sale are enterprises that should be analyzed separately. This number is the numerator for the calculation of pounds of raised/purchased feed fed per breeding cows. The beginning fiscal year inventory of breeding cows will be the denominator.

Average raised/purchased feed fed to breeding cows is the average pounds of raised and purchased feed fed per breeding cow and is calculated by dividing the total pounds fed by the number of cows on hand at the beginning of the fiscal year (16a/8).

17. Marketing data and information provides the descriptive information on the marketing and pricing methods used for weaned steers, weaned bulls, weaned heifers, aged females, and aged bulls. Rank the methods used in terms of importance with one being the most important and indicate the dominant method used.

18. Weaned calf production and value are the values that must be net payweight prices and weights for calves at weaning time. If the calves are not sold, then these values should be estimated. Weights are, of course, extremely important. Bull calf values for the calves saved to produce bulls for sale are the calves estimated value if marketed at their commercial steer value.

19. Female sales are placed into two categories of cull sales to be recorded, those sold for slaughter and those sold as breeding costs. This is even if the expectation is to produce only calf.

20. Aged bull sales are placed into two categories of cull bull sales to be recorded, those sold for slaughter and those aged bulls sold for breeding purposes, even if for only one breeding season.

21. Total females exposed at the beginning of the breeding season is the number of females in the beginning inventory that are exposed either to bulls or in an artificial insemination (AI) program. The number should correspond to the number on the beginning date of the breeding season.

22. Culled exposed females not intended to be calved but in exposed herd are cows that are often identified to be culled at the beginning of the breeding season but are left in the exposed cow herd. For example, older cows that have a nursing calf that will be culled when the calf is weaned. This number should not include those females that are diagnosed as open during pregnancy testing.

23. Exposed females sold or transferred out before the breeding season ends are exposed females that are sold before the breeding season ends and should not be counted in the calculation of reproduction or production performance. Cows sold because they are diagnosed as open, based on a pregnancy test, should not be counted here either as these sales are made after the breeding season ends.

24. Exposed females purchased or transferred in during the breeding season is a count of the exposed females that are purchased. The actual reproductive performance reflects previous owner's management which must be considered as part of the total exposed females.

25a. Open females sold or transferred out after the breeding season are females that are not pregnant and are removed from the breeding herd. This does not include any females that were not intended to be pregnant (item 22). This number should be included in the number of females diagnosed as open (item 35a), the number of sales or transfers of open females (item 36a), and the number of exposed females (item 29).

25b. Pregnant females sold or transferred out after the breeding season are females that are

pregnant and removed from the breeding herd. This does not include any females that were not intended to be pregnant (item 22). This number should be included in the number of females diagnosed as pregnant (item 34a), but subtracted from the number of exposed females (item 29).

25c. Exposed females sold or transferred out after the breeding season are those cows that have not had pregnancy tests performed before the sale or transfer out. The number should be recorded here and will be included in the number exposed females (item 29).

25d. Total females sold or transferred out after the breeding season – (25a + 25b + 25c) are all the females leaving the breeding herd after the breeding season is over.

26. Exposed females purchased or transferred in after the breeding season are all the females entering the herd after the breeding season. This allows for the inclusion of purchased exposed or bred females in the exposed female count.

27. Females sold or transferred out with nursing calves between calving and weaning are the exposed females that are sold or transferred out with nursing calves. They should be deducted from the exposed females and the calves from the number of calves born. Since these are females that met the first reproduction test (birth of a live calf), exclusion of them will likely reduce the overall weaning performance level.

28. Females purchased or transferred in with nursing calves between calving and weaning are the cows that were exposed by the previous owner so they should be included in the exposed in the exposed female count. Since they have calves, they should increase the overall performance measure at weaning.

29. Adjusted exposed females including sales, transfers, purchases of pairs and exposed and pregnant females – (21 – 22 – 23 + 24 – 25b + 26 – 27 + 28) is an inventory of exposed females that results from the beginning inventory plus all of the adjustments. This is the most critical number that must be generated by the inventory in the reproduction and production performance measures of the cow-calf enterprise. The accuracy of this value will determine the overall accuracy of the productivity analysis. The key is careful, monthly inventory maintenance and consistency between operating cycles. This number begins with the beginning inventory on day one of the breeding season, subtracts culls (item 22), as well as sales of transfers out (items 23, 25b, 27) and adds purchases or transfers in (items 24, 26, 28). The net result is used to determine the weaned calf percentage and other production measures of performance.

30a. Total death loss of exposed females is the value that reflects the death loss of exposed females for the exposed female group. Fiscal year financial statement adjustments must be in the fiscal year of death which will prevent double counting death loss between years.

30b. Percent death loss – (30a/29) * 100: The total death loss is also expressed as a percentage of total exposed females (item 29).

31. Replacement heifers exposed for first calf plus purchased replacement heifers and cows to expose or exposed in beginning inventory (item 21), as illustrated in the SPA Guidelines, must be

carefully interpreted. Some exposed females may be actually used to replace culled females; however, increases in herd size could also be included in this number. This number should reflect the number of purchased or transferred in female breeding animals while also including both raised and purchased heifers and mature cows.

32. Replacement rate based on females exposed $(31/29) * 100$ is measured in terms of total exposed females as described in item 29. The numerator is defined in item 31 and is expressed as a percentage of total exposed females (item 29)

Note: Exposed female numbers should include all replacement heifers as well as adult breeding cows. Female numbers should not be adjusted for death loss.

33. Number of exposed females that are pregnancy tested will be the base number used to calculate the pregnancy rate after adjustments are made. Include females, which were pregnancy tested and sold or transferred out of the breeding herd after the breeding season (item 25a and item 25b).

34a. Number of females diagnosed as pregnant is the actual number of exposed females diagnosed as pregnant. The accuracy of the pregnancy rate improves when all females that are exposed pregnancy tested. Include females, which were diagnosed as pregnant, but sold or transferred out of the breeding herd after the breeding season (item 25b).

34b. Pregnancy percentage – $(34a/33) * 100$ expresses the number of females diagnosed as pregnant as a percentage of the number of exposed females that are pregnancy tested.

35a. Number of females diagnosed as open – $(33/34a)$ is the number of females diagnosed as not being pregnant or the total number of pregnancy tested minus those diagnosed as being pregnant. Includes females which were diagnosed as open but sold or transferred out of the breeding herd after the breeding season ended(item 25a).

35b. Percent open – $(35a/33) * 100$ reflects this value as a percentage of the total number of exposed females that are pregnancy tested.

36a. Sales or transfers of open exposed females intended to be bred during the breeding season but failed to conceive is the number of females culled and sold due to reproductive failure. Include females which were diagnosed as open but were sold or transferred out of the breeding herd after the breeding season ended (item 25a).

36b. Percent open sold or transferred – $(36a/35a) * 100$ expresses this value (item 36a) as a percentage of the number of females diagnosed as open (item 35a).

37a. Number of open females kept in breeding herd – $(35a-36a)$ is the number of open females that are retained in the breeding herd for a “second chance”. Open females sold or transferred out (item 36a) subtracted from total open females (item 35a) gives open females kept.

37b. Percent open females kept $(37a/35a) * 100$ is the relationship between the number of open

females kept in the herd and the number of females diagnosed as open.

38a. Total calves born is the total number of calves born. It includes the number of all births of full term calves even if the calves are born dead (i.e., calves which died during calving due to dystocia) but do not include abortions (i.e., calves which have not reached full term).

38b. Calving percentage – $[38a/(29+27-28)]*100$ is the total number of calves born either alive or dead expressed as a percentage of exposed females.

38c. Calving distribution records the total number of calves born. Then it records all births within the first 21-days of the calving season, between 22 and 42 days, 43 to 63 days, and births after 63 days. Accumulative total is also maintained. Include births of full term calves even though calves may have died during the calving process.

Note: Compute calving distribution at each of these days. The starting date for the first 21-day period is 285 days following the bull turn in date with the mature cow herd. If this is unavailable, then start the first 21-day period when the third mature cow (three years and older) calves. All calves born, either alive or dead, should be included in this analysis.

39. Calf loss due to calving problems is included in the count of the number of full term calves that died due to calving problems.

40. Total live calves born are only those calves which were actually alive at the time of birth. Do not include calves that died during the calving process (item 39).

41a. Calving percentage based on exposed females and live calves produced – $[40/(29+27-28)]*100$ is the number of live births (item 40) as a percentage of the adjusted exposed female count (items 29, 27 and 28).

41b. Calving death loss percentage based on exposed females – $[39/(29+27-28)]*100$ is the number of calf deaths due to calving problems, such as dystocia (item 39), expressed as a percentage of exposed females.

41c. Calving death loss based on calves born – $(39/38a)*100$ is the number of deaths due to calving problems (item 39) expressed as a percentage of the total calves born (item 38a).

42. Nursing calves purchased and grafted onto females in herd are those baby calves that are purchased and placed on females in the herd whose calves have died at birth. Grafted calves are not included in calculating calving or calf crop percentage, but are included in revenue and weaned calf production values.

43. Total weaned calves is a total head count of all the calves actually weaned during the weaning period.

44. Average age at weaning (months) is the average age, in months, that the calves were at weaning.

Standardized Performance Analysis – Production Measures

Listed below are the reproduction, production, and the grazing and feed fed measures recommended by the NCBA Cow-calf SPA Subcommittee. The computation, interpretation, and limitation of each measure calculated and reported follows. As can be noted, select measures are identified as primary measures and other as secondary measures. Primary measures (a single asterisk) are those the committee felt are essential for a meaningful production performance analysis. Secondary measures (two asterisks) are values that are very valuable for evaluation, but viewed as difficult to attain data in some production environments so are not viewed as essential to do a meaningful performance evaluation.

Reproduction

- Based on Exposed Females
 - Pregnancy Percentage **
 - Pregnancy Loss Percentage **
 - Calving Percentage **
 - Calf Death Loss **
 - Calf Crop or Weaning Percentage *
 - Female Replacement Rate **
- Calf Death Loss Based on Calves Born
- Calving Distribution **
 - Cumulative Distribution **
 - Calves in first 21 days
 - Calves in first 42 days
 - Calves in first 63 days
 - Calves after first 63 days.

Production

- Based on Exposed Females
 - Average Calf Weaned Age (months)
 - Actual Weaning Weights (lbs/hd.) *
 - Steers / Bulls
 - Heifers
 - Average Weaning Weight
 - Pounds Weaned per Exposed Female *

Grazing

- Grazing and Raised Feed Land Measures
- Acres per Exposed Female **
 - Grazing Acres per Exposed Female
 - Raised Feed Acres per Exposed Female
 - Crop Aftermath Acres per Exposed Female
- Pounds Weaned per Acre Utilized by the Cow-calf Enterprise *
- Dominant Grazing Method – Exposed Females **
- Pounds of Raised/Purchased Feed Fed per Breeding Female **

** Primary performance measures that must be supplied by the participant.

*** Secondary performance measures that the participant may not be able to provide.

PREGNANCY PERCENTAGE

Computation

$$\text{Pregnancy Percentage} = \frac{\text{Number of Females Exposed Diagnosed as Pregnant}}{\text{Number of Females Exposed}} * 100$$

Accurate computation requires the following adjustments to the number of females actually exposed during the breeding season.

- 1) Subtract the number of exposed pregnant females sold or transferred out between breeding and pregnancy diagnosis (from the number of exposed females).
- 2) Add the number of exposed females or pairs purchased between breeding and pregnancy diagnosis.

Interpretation: This is a secondary measure performance that the participant may not be able to provide. This measure of performance is a good indicator of breeding performance in the herd. If the measure is lower than the average of similar operations, it may indicate that the nutritional program is inadequate, that bull power or fertility is inadequate, that there is the presence of diseases causing early embryonic death, or that there is a mismatch between herd genetics and the environment (i.e., feed resources and management style). The meaning of this percentage is greatly enhanced if measured by female age group since rebreeding is often only a problem with certain age groups (i.e., females exposed for their second calf).

Limitations:

1. As with any measure of reproductive performance, this value should be used only in comparing similar operations.
2. This value may only indicate that a problem exists with little indication of the cause of the problem.
3. There will be year-to-year variation due to environmental stresses (i.e., droughts, severe winters, etc.).
4. This value will only be available to production systems that routinely diagnose pregnancy through rectal palpation procedures. However, small herds with good heat checking will know who is not pregnant without rectal palpation and, therefore can calculate this percentage.
5. Adding in exposed females may influence the pregnancy percentage.

Notes:

- a) Do not count purchased females (pairs) which are open and added to the herd between breeding and pregnancy diagnosis. Do include purchased females (pairs), which are diagnosed as pregnant or exposed and added to the herd between breeding and pregnancy diagnosis.
- b) All death losses of exposed females should remain in the exposed female numbers.
- c) Females that are intended to be culled and sold, but remain in the exposed female herd during the breeding season, should be subtracted from the exposed number when sold.

PREGNANCY LOSS PERCENTAGE

Computation:

$$\text{Pregnancy Loss Percentage} = \frac{\text{[(Number of Females Diagnosed as Pregnant That Failed to Calve / Number of Females Diagnosed as Pregnant) * 100]}}{1}$$

$$\text{Pregnancy Loss Percentage} = (\text{Pregnancy Percentage} - \text{Calving Percentage})$$

Accurate computation requires the following adjustments to the number:

1. Females that abort and are sold between pregnancy diagnoses and calving should be included in the numerator.
2. Subtract pregnant females sold and add pregnant females purchased to the divisor.

Interpretation: This is a secondary measure performance that the participant may not be able to provide. This measure is a good indicator of reproductive performance. If the measure is higher than the average of similar operations, it may indicate late pregnancy reproductive disease problems, which cause abortions. When kept over time, this measure may point out a potential problem prior to its becoming serious. There may be nutritional inadequacies of feedstuff quality groups or a management problem with females.

Limitations:

1. As with any measure of reproductive performance, this value should be used only in comparing similar operations.
2. This value may only indicate that a problem exists with little indication of the cause of the problem.
3. There will be year-to-year variation due to environmental stresses (i.e., droughts, severe winters, etc.).
4. This value will only be available to those who routinely diagnose pregnancy through rectal palpation procedures. However, small herds with good heat checking will know which females are not pregnant without rectal palpation, therefore, can calculate this pregnancy loss.
5. Accuracy is reduced if only a portion of the total herd is tested for pregnancy. The exposed females not tested may have a higher or lower pregnancy rate.

Notes:

- a) Do not count purchased females or pairs, which are open and added to the herd between pregnancy diagnosis and calving season.
- b) All death losses of pregnant females should remain in the females diagnosed as pregnant numbers.

CALVING PERCENTAGE

Computation:

$$\text{Calving Percentage} = \left[\frac{\text{Number of Calves Born}}{\text{Number of Females Exposed}} \right] * 100$$

Accurate computation requires the following adjustments to the number of females actually exposed during the breeding season:

1. Subtract the number of exposed pregnant females sold or transferred out between breeding and calving (from the number of exposed females).
2. Add the number of exposed females or pairs purchased between breeding and calving (to the number of exposed females).

Interpretation: This is a primary performance measure that must be supplied by the participant. This measure of performance is a good indicator of breeding performance and gestational management in the herd. If the measure is lower than the average of similar operations, it may indicate that the nutrition or grazing program is inadequate, that bull power or fertility is inadequate, that there is the presence of diseases causing embryonic death, or that a mismatch between herd genetics and the environment exists. The meaning of this percentage is greatly enhanced if it is kept by female age group since rebreeding is often a problem with certain age groups (i.e., rebreeding first-calf heifers).

Limitation:

1. As with any measure of reproductive performance, this value should be used only in comparing similar operations.
2. This value may serve only as an indicator of an existing problem but does little to pinpoint the cause.
3. Year-to-year variation will exist in this value due to environmental stresses.
4. This value does not indicate in what manner the calf crop is born. Are the calves tightly grouped or spread out?

Notes:

All "term" calves born should be included in the number of calves even if they are dead on arrival.

CALF DEATH LOSS

Computation:

Calf Death Loss Based on Exposed Females =
[(Number of Calves Which Died / Number of Exposed Females) * 100]

Calf Death Loss Based on Calves Born =
[(Number of Calves Which Died / Number of Calves Born) * 100]

Interpretation: This is a primary performance measure that must be supplied by the participant. This measure of performance can be very useful in evaluating the herd health program, calving environment, nutritional program, and genetic selection program. The cause of death in each case would make the information much more valuable since calf losses can result from many factors at or following birth.

Limitations:

1. The type of operation, extensive versus intensive, should be considered when a comparison is made using this measure of performance.
2. The age make-up of the cow herd could influence calf death low and must be considered when comparisons are made between herds.
3. Calf death loss at birth versus death loss during the suckling period is not distinguished here. Therefore, one may want more detailed records if consistently high calf death loss occurs.

Notes:

Calf death loss should include those calves lost at birth and any that die up to weaning time. Abortions before calving should be included in the pregnancy loss percentage.

CALF CROP OR WEANING PERCENTAGE

Computation:

$$\text{Calf Crop or Weaning Percentage} = \frac{\text{Number of Calves Weaned}}{\text{Number of Females Exposed}} * 100$$

Accurate computation requires the following adjustments to the number of females actually exposed during the breeding season:

1. Subtract the number of exposed pregnant females sold or transferred out between breeding and weaning (from the number of exposed females).
2. Add the number of exposed females or pairs purchased between breeding and weaning (to the number of exposed females).
3. Subtract the number of calves purchased and grafted on females from the number of calves weaned.

Interpretation: This is a primary performance measure that must be supplied by the participant. This percentage measures the reproductive rate of the herds, and since reproductive rate has been shown to be a major factor in profitability, it is probably the most important single measure of production performance. Since reproduction is largely a function of nutrition, it is an excellent indicator of the adequacy of the nutritional program. Additionally, it is an excellent indicator of how well the cows are matched to the resources. The adequacy of the herd health program used and any disease problems can be, in part, evaluated by this measure. As with any measure of performance used in evaluating cow herd management, comparisons should only be made between herds with similar calving seasons, management systems, and environmental inputs.

Limitations:

1. This measure of performance is a good indicator of total herd output, nutritional adequacy and managerial skills or husbandry practices. It should be noted that this measure does not account for excessive use of feed and non-feed inputs.
2. Calf crop percent may not correlate highly to economic performance. This is seen in cases where cull marketing decisions are made prior to times of high input costs and when the measure is compared to herds where this practice is not followed.

Notes:

- a) All death losses of exposed females should remain in the exposed female numbers.
- b) Females that are intended to be culled and sold, but remain in the exposed female herd during the breeding season, should be subtracted from the exposed number when sold.

- c) The exposed females that were intended to be bred, but are later culled when found open, must remain in the exposed number.
- d) Do not include purchased grafted calves that are nursing cows in the number of weaned calves.

FEMALE REPLACEMENT RATE

Computation:

Female Replacement Rate =

$$\frac{[(\text{Raised Replacement Heifers Exposed for First Calf} + \text{Purchased Replacement Heifers and Breeding Cows Exposed}) / \text{Number of Females Exposed}] * 100}{}$$

Accurate calculation requires the following adjustments to be computed:

1. Subtract the number of heifers sold or transferred out from the number of heifers exposed.
2. Add the number of heifers and cows purchased between breeding and calving to the number of heifers exposed.
3. Using the previously defined female exposed definition includes both heifers and cows in the number of females exposed.

Interpretation: This is a secondary performance measure that the participant may not be able to provide. This measure of performance is a good indicator of herd replacement rate and cow longevity. If this percentage is higher than the average of similar operations it may indicate the herd has reproductive problems or may be in an expansion phase. Generally, a high percentage will mean higher herd costs and lower productivity per cow because a larger portion of the herd is first and second calving females. Also, if this percentage is high, it may mean the current genetic type does not match the resources and thus causes a higher than normal culling rate and heifer retention. A low percentage may indicate the herd is in a liquidation phase.

Limitation:

- a) As with any measure of performance, this value should be used only in comparing similar operations.
- b) This value may only indicate that a problem exists with little indication of the cause of the problem.
- c) Market fluctuations may cause this percentage to vary more than production factors in some herds.
- d) Farmers or ranchers with herds in either an expansion or liquidation phase will find this percentage hard to compare and of less value.

CALVING DISTRIBUTION

Computation:

Calving Distribution =

[Cumulative Number of Calves Born by 21, 42, and 63 Days and Those After 63 Days of the Calving Season / Total Number of Calves Born] * 100]

Note: Compute calving distribution at each of these days. The starting date for the first 21-day period is 285 days following the bull turn in date with the mature cowherd. If this is unavailable, then start the first 21-day period when the third mature cow (three years and older) calves. All calves born, either alive or dead, should be included in this analysis.

Interpretation: This is a secondary performance measure that the participant may not be able to provide. Since calf weaning weight and uniformity of the calf crop is greatly affected by calf age, this measure of how early in the calving season that calves are born is an excellent measure of reproductive performance. This measure is very useful in evaluating the adequacy of nutrition during crucial reproductive periods and adequacy of bull power, herd health, and heifer development programs.

Calving distribution is most useful if calculated by the age of females since the distribution for certain groups, particularly second calf-heifers, is often much lower than for the mature cows. Additionally, separate calculations by age of females may be necessary for meaningful comparisons when yearling heifers are bred prior to cow herd.

Limitations:

1. This measure of performance may not be as useful in the southern part of the U.S. as in the northern part where pasture growth is more seasonal; however, a tight calving distribution has many benefits in all environments.
2. Calving distribution cannot be used in extensive grazing environments where accurate counts of the number of calves born may be difficult to obtain.

ACTUAL WEANING WEIGHTS

Computation:

Steer/Bull Calf Weaning Weight =

(Total Weight of Weaned Steer and Bull Calves / Total Number of Weaned Steer and Bull Calves)

Heifer Calf Weaning Weight =

(Total Weight of Heifer Calves / Total Number of Heifer Calves Weaned)

Average Weaning Weight =

(Total Weight of Weaned Calves / Total Number of Calves Weaned)

Average Age at Weaning (Months)

Calving distribution should be considered when evaluating average age at weaning.

Interpretation: These are primary measures that must be supplied by the participant. While weaning weight is extremely difficult to interpret, it must be assessed to measure productivity and performance. As with any other measure, it must be compared to similar operations in order to have any meaning. The best use of this measure of performance is to establish gross revenue for the operation and to evaluate the effect of changes in the breeding program or management. Also, since the environment and feed supply greatly affect weaning weights in any year, long-term trends should have more useful meaning than yearly changes.

Limitations:

1. Since producers calve and wean calves at different times and ages, actual weaning weights are not standardized to age. However, including average aged weaning in the data serves as a guide in interpreting weaning weights for comparative purposes.
2. Due to pasture production and management, it can be difficult to compare weaning weights between operations. This is especially a problem when comparing fall versus spring calving herds in which calf weaning age may differ by three months. Where two calving seasons are used, it is best to do a separate analysis for each season.
3. Weaning weights are greatly affected by annual environmental conditions. For example, high and low levels of moisture, extremes in temperature, etc., which are beyond the managers control can influence weaning weights more than all controlled management factors. Thus, producers should avoid placing too much emphasis on the weights for any single year and should concentrate on long-term trends.
4. Users of this measure must remember that higher weaning weights normally mean higher gross revenue, but not necessarily increased profit. Increased profit is dependent also on calf crop and production costs.

POUNDS WEANED PER EXPOSED FEMALE

Computation:

$$\text{Pounds Weaned Per Exposed Female} = \frac{\text{Total Pounds of Calf Weaned}}{\text{Total Number of Females Exposed}}$$

Interpretation: This is a primary performance measure that must be supplied by the participant. This calculation combines into one figure the herd reproductive rate, calf death loss, and genetics for growth and maternal traits. Thus, from a herd production standpoint, this is probably the best measure of performance. This measure is a tool to assist producers in managing the tradeoffs between growth rate and reproductive rate. In other words, concentrating on improving the number of pounds weaned per cow exposed should be more profitable than emphasizing either calf crop or weaning weights separately.

Limitations:

1. Since this number is a combination of the measures used to analyze reproduction and production, it has some of the limitations of each.
2. Age at weaning and distribution of calving can influence this value a great deal by making it more valuable as a measure for an individual operation than for comparison between farms or ranches.

Note:

The number of females exposed must be adjusted for the same factors that were used in the calf crop percent calculation.

GRAZING, RAISED FEED, AND CROP AFTERMATH ACRES PER EXPOSED FEMALES

Computation:

Grazing and Raised Feed Acres Per Exposed Females =
(Total Grazing Acres + Crop Aftermath Acres / Total Number of Exposed Females)

Grazing Acres Per Exposed Female =
(Grazing Acres / Total Number of Exposed Females)

Raised Feed Acres Per Exposed Female =
(Raised Feed Acres / Total Number of Exposed Females)

Crop Aftermath Acres Per Exposed Female =
(Crop Aftermath Acres / Total Number of Exposed Females)

Pounds Weaned Per Acre Utilized by Cow-calf Enterprise =
Where land has more than one use such as corn grain production and corn stalks, grazing land use should be adjusted to the time actually used for grazing purpose.

Interpretation: These are secondary performance measures that the participant may not be able to provide. This is a measure of the primary input in the cow-calf enterprise – forage land. These measures also provide a description of the production system that the producer can monitor over time. As a primary input, management of forages has an important impact on production costs.

Limitations:

1. Differences in acres of the grazing and feed sources are most valuable for the same operation over time. Farms and ranches in the same area can be useful comparative analysis. However, these values have limited use in comparing different regions for land with different production capacity.
2. Acres of land do not reflect forage production quality or differences in production.
3. Adjusting for the time that land is used for grazing or growing another crop does require judgment. Consistency between years is important.
4. Adjustments in grazing time must be made when supplemental feeding and grazing is simultaneous based on the portion of cow requirements being met by grazing.

RAISED/PURCHASED FEED FED PER BREEDING COW

Computation:

$$\text{Raised/Purchased Feed Fed Per Breeding Cow} = \frac{\text{Total Pounds of Raised and/or Purchased Feed Fed}}{\text{Number of Breeding Females}}$$

Accurate computation of this performance measure requires the following:

1. Keep track of feed used on a daily or weekly basis and then summarize for the year or use the inventory analysis procedure. The inventory analysis procedure is beginning year feed inventory, plus production and purchases, less sales and use by other livestock, less year ending inventory.
2. Conversion of high moisture feedstuffs (i.e., silages) to an air dry basis.

Interpretation: This is a secondary performance measure that the participant may not be able to provide. This measure is an excellent indicator of efficient resource use and cost control. Because harvested and purchased feed fed represent a major expense in most operations, this measure, when compared to other operations within a region, can indicate either a strength or weakness in herd nutritional management. This measure would include feed fed to replacement heifers and bulls, which support the cow-calf enterprise. If the feed needed per breeding female is higher than average, it could indicate over-feeding, below normal pasture production or utilization, above normal feed wastage, below normal use of aftermath grazing, below average feed quality, or above average female replacement rate. Herds with larger grazing resources will have lower quantities in this area, while herds with limited grazing resources will have larger harvested/purchased feed utilization. Caution should be exercised when one is comparing this measure between herds. This measure is useful for an individual operation when kept over a period of time so progress can be measured.

The number of breeding females is defined as mature females and heifers of breeding age shown on the beginning fiscal year balance sheet.

Limitations:

1. An accurate measure of feed fed requires either good feed use records or a good inventory and use analysis procedure.
2. Type of feed fed can vary greatly in energy and protein density from ranch to ranch or year to year, thus making comparisons less accurate.
3. For this measure, it will be difficult to measure herds in either an expansion or liquidation phase.

Notes:

Feed being fed to replacement female stock and bulls needs to be included in the total quantity of feed utilized by the producing herd. It is important to convert all high moisture feedstuffs to an air-dry basis. For instance, 6,000 pounds of silage containing 60% moisture would convert to approximately 2,760 pounds of air-dry feed with 13% moisture.

CATTLE INVENTORY DATA REQUIREMENTS FOR THE SPA PRODUCTION ANALYSIS

Before attempting to do the production analysis, select information concerning cattle inventory must be organized for the fiscal year that is to be analyzed. This may best be organized by production/management seasons. Figure 2 shows the SPA production key data areas in the analysis. The gestation table that follows is helpful in identifying calving dates during the production cycle. Specific cattle inventory items are as follows:

- 1) Breeding Season Inventory
 - a) Exposed females are mature cows and heifers of breeding age
 - b) Number of females considered as replacements
 - c) Number of females not intended to be calved but are in exposed herd
 - d) Sales, purchases, and transfers-in and out during the breeding season
 - e) Death losses.

- 2) Pregnancy Testing Inventory
 - a) Pregnant females
 - b) Open females
 - c) Sales, purchases, and transfers-in and out between breeding and pregnancy testing
 - d) Death losses

- 3) Balance Sheet Inventory
 - a) Number of breeding females

- 4) Calving Inventory
 - a) Inventory of pregnant females at the beginning of the calving season
 - b) Calving losses at birth is desirable
 - c) Number of live and dead calves born by 21 day intervals
 - d) Number of females calving
 - e) Number of purchased calves grafted onto females in herd
 - f) Sales, purchases, and transfers-in and out of females and calves between calving and weaning

- 5) Weaning Inventory
 - a) Inventory of females at weaning time
 - b) Calculate average age of calves at weaning
 - c) Death losses between calving and weaning
 - d) Calves weaned and weight by sex

Monthly inventory worksheets are available in the SPA Workbook and should help keep this information if an alternative is not already in place for the farm or ranch operation.

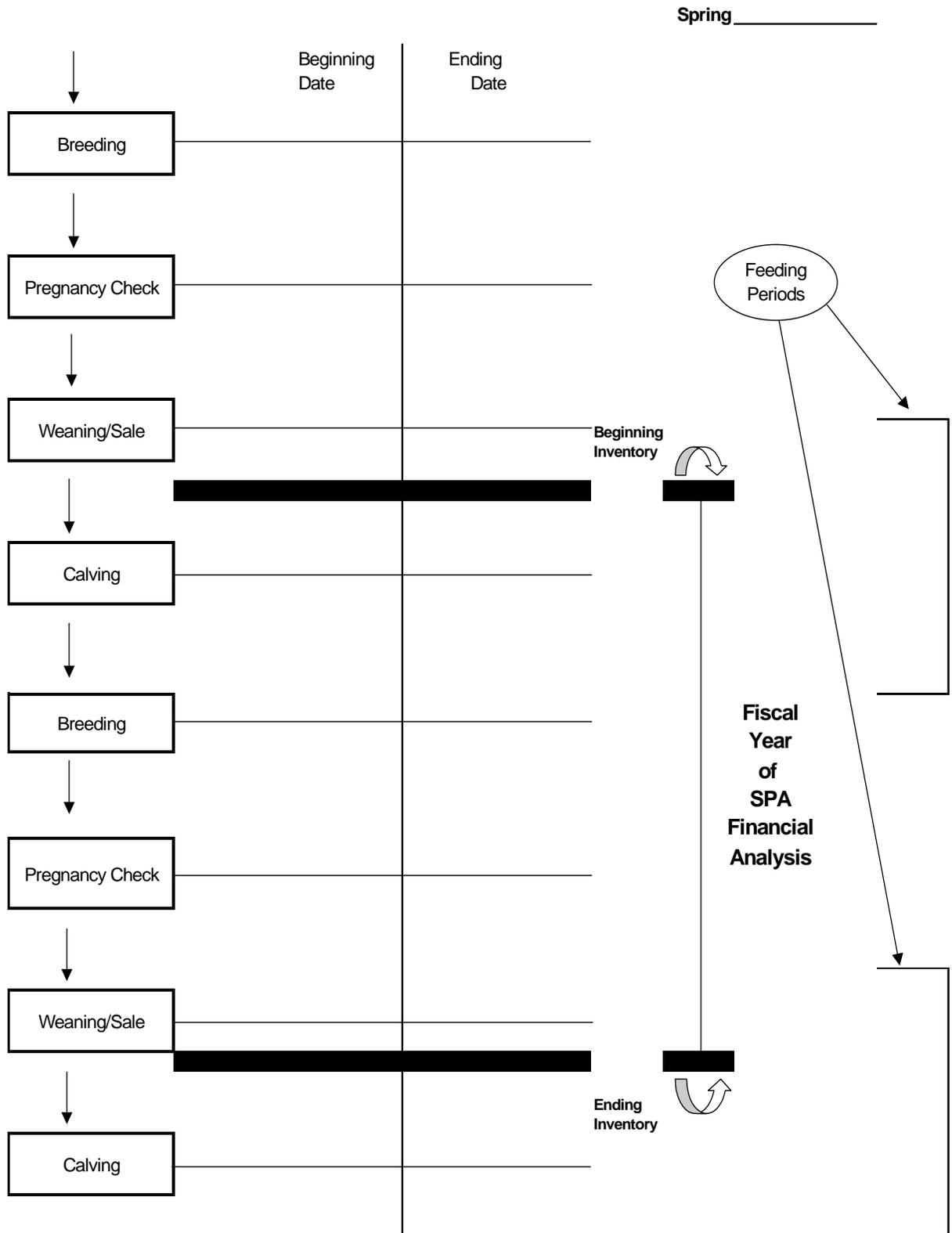


Figure 1. SPA Production Cow-Calf **Spring Calving Season** and Calendar Fiscal Year Key Data Areas.

GESTATION TABLE (285 day)

Find date of service in upper line. Figure below indicates date due to calve.

Jan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Oct	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12Nov
Feb	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
Nov	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10			Dec
Mar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Dec	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10Jan
Apr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Jan	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	Feb
May	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Feb	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12Mar
Jun	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Mar	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	Apr
Jul	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Apr	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12May
Aug	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
May	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12Jun
Sep	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Jun	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	Jul
Oct	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Jul	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12Aug
Nov	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Aug	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	Sep
Dec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Sep	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12Oct

**DESCRIPTION AND MARKETING DATA FOR THE COW-CALF
SPA PERFORMANCE MEASURE**

Date filled out: _____

Name of Person Filling out form: _____

Phone #: _____

E-mail: _____

1. Producer Code: _____

2. Fiscal Year: _____
Beginning Date *Ending Date*

3. Farm or Ranch Location: _____
State *Region*

County *Zip Code*

4. Business Description:
 Business Organization: _____
 Accounting Method: _____

5. Precipitation (Inches): _____
Normal Annual *Fiscal Year*

6. Type of Enterprise (commercial or seedstock, spring or fall calving): _____

7. Cow-calf Enterprise Gross Revenue as a
 Percent of Total Farm or Ranch Gross Revenue: _____

8. Size of Herd—Number of Breeding Cows (hd.)³: _____

9. Management/Production Seasons for Mature Females:

	Beginning Date	Ending Date
a) Breeding ⁴	_____	_____
b) Pregnancy Testing	_____	_____
c) Calving	_____	_____
d) Weaning	_____	_____

10. Dominant Grazing Method – Exposed Female: (Rotational or Continuous)

3. Breeding cows are defined as mature females and heifers of breeding age that have the potential to calve and wean a calf during the fiscal year. This should correspond to the number included on the beginning fiscal year balance sheet.

4 For consistency, use Mature Cow Beginning Breeding Date even though heifers' beginning breeding date may be different.

OWNED LAND:

11. Grazing Acres--Cow-Calf Enterprise:

Type of Pasture or Crop	Total Acres	Cow-calf Enterprise Use		Lease Equiv. \$/Ac. ⁵	Lessor Costs \$/Ac ⁶
		%	Acres		
(a) Native Unimproved (Rangeland)					
(b) Native Improved					
(c) Improved Perennial					
(d) Annual Pasture or Forage Crop					
(e) Woodland (Grazeable Forestland)					
(f) Crop Aftermath					
(g) Totals ⁷ (a+b+c+d+e+f)					

Opportunity Cost Owned Grazing Land (net lease equivalent)⁸ _____

12. Raised Feed Acres:⁹

Type of Pasture or Crop	Total Acres	Cow-calf Enterprise Use		Lease Equiv. \$/Ac.	Lessor Costs \$/Ac
		%	Acres		
(a) Native Unimproved (Rangeland)					
(b) Native Improved					
(c) Improved Perennial					
(d) Annual Pasture or Forage Crop					
(e) Woodland (Grazeable Forestland)					
(f) Crop Aftermath					
(g) Totals (a+b+c+d+e+f)					

Opportunity Cost Owned Raised Feed Acres (net lease equivalent)⁸ _____

5 Lease equivalent is the annual rate that could be received if the owned land were leased.

6. Lessor costs are expenses that would be incurred by the landowner (in the event that the land is leased, including property tax they normally pay and shared costs to maintain the land in suitable condition. The amount and type of costs included here are dependent on the type of lease agreement that would be signed.

7. Total for lease equivalent and lessor cost (11g) is the sum of the \$/Acre figure times the acres used by the enterprise.

8. Opportunity cost owned grazing land (net lease equivalent) is the total lease equivalence minus the lessor cost.

9. Opportunity cost owned raised feed acres (net lease equivalent) is the total lease equivalence minus the lessor cost.

LEASED LAND:

13. Grazing Acres--Cow-Calf Enterprise:

<u>Type of Pasture or Crop</u>	<u>Total Acres</u>	Cow-calf Enterprise Use	
		<u>%</u>	<u>Acres</u>
(a) Native Unimproved (Rangeland)			
(b) Native Improved			
(c) Improved Perennial Annual Pasture or			
(d) Forage Crop Woodland			
(e) (Grazeable Forestland)			
(f) Crop Aftermath			
(g) Totals (a+b+c+d+e+f)			

14. Raised Feed Acres:

<u>Type of Pasture or Crop</u>	<u>Total Acres</u>	Cow-calf Enterprise Use	
		<u>%</u>	<u>Acres</u>
(a) Native Unimproved (Rangeland)			
(b) Native Improved			
(c) Improved Perennial Annual Pasture or			
(d) Forage Crop			
(e) Crop Aftermath			
(f) Totals (a+b+c+d+e)			

FEED USE SUMMARY

	As Fed (Lbs.)	Lbs. Per Head	Market Value
15a	Raised Feed:		
	_____	_____	_____
	Roughage	_____	_____
	Complete Feed or Concentrate	_____	_____
	Protein Supplement	_____	_____
	Total Raised Feed	_____	_____
15b.	Purchased Feed		
	_____	_____	
	Roughage	_____	
	Complete Feed or Concentrate	_____	
	Mineral and Salt	_____	
	Protein Supplement	_____	
16.	Total Raised and Purchased Feed	_____	_____

17. Marketing Data and Information:

A. Weaned Calves – Marketing Methods in Order of Importance With 1 Being Most Important:

	Weaned Steers	Weaned Bulls	Weaned Heifers
Auction	_____	_____	_____
Direct – Video	_____	_____	_____
- Private Treaty	_____	_____	_____
Consignment	_____	_____	_____
Forward Contract	_____	_____	_____
Retained Ownership	_____	_____	_____
Rail	_____	_____	_____
Grade and Yield	_____	_____	_____
Dominant Method	_____	_____	_____

B. Weaned Calves – Dominant Methods of Pricing:

Cash	_____	_____	_____
Futures	_____	_____	_____
Options	_____	_____	_____
Forward Cash Contract	_____	_____	_____
Dominant Method	_____	_____	_____

C. Weaned Calves – Dominant Breed:

_____	_____	_____
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D. Breeding Stock – Marketing Methods in Order of Importance With 1 Being Most Important:

	Aged Females		Aged Bulls	
	Culls	Breeding	Culls	Breeding
Auction	_____	_____	_____	_____
Direct – Video	_____	_____	_____	_____
- Private Treaty	_____	_____	_____	_____
Consignment	_____	_____	_____	_____
Forward Contract	_____	_____	_____	_____
Retained Ownership	_____	_____	_____	_____
Rail	_____	_____	_____	_____
Grade and Yield	_____	_____	_____	_____
Dominant Method	_____	_____	_____	_____

B. Breeding Stock – Dominant Methods of Pricing:

Cash	_____	_____	_____	_____
Futures	_____	_____	_____	_____
Options	_____	_____	_____	_____
Forward Cash Contract	_____	_____	_____	_____
Dominant Method	_____	_____	_____	_____

C. Breeding Stock – Dominant Breed:

_____	_____	_____	_____
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18. Weaned Calf Production and Value:

Weaned Calves	Head	Total Weight	\$ Total Value	Weight /Head	\$ Value /Head	Value /cwt
(a) Bulls	_____	_____	_____	_____	_____	_____
(b) Steers	_____	_____	_____	_____	_____	_____
(c) Heifers (non-replacement)	_____	_____	_____	_____	_____	_____
(d) Heifers for replacement	_____	_____	_____	_____	_____	_____
(e) Total	_____	_____	_____	_____	_____	_____

	Head	Total Weight	\$ Total Value	\$/cwt	\$/Hd.
19. Aged Female Sales					
(a) Culls – Slaughter	_____	_____	_____	_____	_____
(b) Breeding Cows	_____	_____	_____		_____
20. Aged Bull Sales					
(a) Culls – Slaughter	_____	_____	_____	_____	_____
(b) Breeding Bulls	_____	_____	_____		_____

REPRODUCTION AND PRODUCTION DATA FOR THE COW-CALF SPA PERFORMANCE MEASURES

INVENTORY RECONCILIATION FOR EXPOSED FEMALES

	Beginning Breeding Season Inventory - Date	<div style="border: 1px solid black; width: 100%; height: 20px; background-color: #cccccc;"></div>
21.	Total females at the beginning of the breeding season.	_____
22.	Culled exposed females not intended to be calved but in exposed herd.	_____
23.	Exposed females sold or transferred out before the breeding season ends.	_____
24.	Exposed females purchased or transferred in during the breeding season.	_____
Adjustments:		
	After Breeding Season Ends Before the Calving Season Begins	<div style="border: 1px solid black; width: 100%; height: 20px; background-color: #cccccc;"></div>
25a.	Open females sold or transferred out after the breeding season.	_____
25b.	Pregnant females sold or transferred out after the breeding season.	_____
25c.	Exposed females sold or transferred out after the breeding season without pregnancy testing.	_____
25d.	Total females sold or transferred out after the breeding season (25a+25b+25c).	<div style="border: 1px solid black; width: 100%; height: 20px; background-color: #cccccc;"></div>
26.	Exposed and pregnant females purchased or transferred in after the breeding season.	_____
Adjustments After the Calving Season Begins:		
27.	Females sold or transferred out with nursing calves between calving and weaning.	<div style="border: 1px solid black; width: 100%; height: 20px; background-color: #cccccc;"></div>
28.	Females purchased or transferred in with nursing calves between calving and weaning.	_____
Adjusted Exposed Females:		
29.	Adjusted exposed females including sales, transfers, purchase or pairs and exposed and pregnant females (21-22-23+24-25b+26-27+28).	<div style="border: 1px solid black; width: 100%; height: 20px; background-color: #cccccc;"></div>

Note: Exposed female numbers should include all replacement heifers as well as adult breeding cows. Female numbers should not be adjusted for death loss.

DEATH LOSS AND REPLACEMENT VALUES:

30a.	Total death loss of exposed females.		
30b.	Percent death loss $(30a/29) \times 100$.	_____	<input type="text"/>
31.	Replacement heifers exposed for first calve plus purchased replacement heifers and cows to expose or exposed.		
32.	Replacement rate $(31/29) \times 100$. ^{**10}	_____	<input type="text"/>

PREGNANCY PERFORMANCE MEASURES:

33.	Number of exposed females that were pregnancy tested.		
34a.	Number of females diagnosed as pregnant.	_____	
34b.	Pregnancy percentage $(34a/33) \times 100$. ^{**}	_____	<input type="text"/>
35a.	Number of females diagnosed as open (33-34a)	<input type="text"/>	
35b.	Percent open $(35a/33) \times 100$.		<input type="text"/>
36a.	Sales or transfers of open exposed females intended to be bred during the breeding season but failed to conceive.		
36b.	Percent open sold or transferred $(36a/35a) \times 100$.	_____	<input type="text"/>
37a.	Number of open females kept in breeding herd (35a-36a).	<input type="text"/>	
37b.	Percent open females kept $(37a/35a) \times 100$.		<input type="text"/>

CALVING PERFORMANCE MEASURES:

38a.	Total calves born – include live and dead calvings (head).		
38b.	Calving percentage based on total females calving and exposed females $[38a/(29+27-28)] \times 100$. [*]	_____	<input type="text"/>
38c.	Calving Distribution: ^{**}	Date	By Period
	(1) Calves born during days 1-21	<input type="text"/>	_____
	(2) Calves born during days 22-42	<input type="text"/>	_____
	(3) Calves born during days 43-63	<input type="text"/>	_____
	(4) Calves born after day 63	<input type="text"/>	<input type="text"/>
39.	Calf loss due to calving problems.		
40.	Total live calves born.	_____	_____

10. A double asterisk (**) denotes a secondary performance measure. A single asterisk (*) denotes a primary measure.

11. This percentage is calculated by dividing the total calves born for the period by item 38c.

- 41a. Calving percentage based on exposed females and live calves produced $[40/(29+27-28)] \times 100$.
- 41b. Calving death loss percentage based on exposed females $[39/(29+27-28)] \times 100$.
- 41c. Calving death loss based on calves born $(39/38a) \times 100$.

WEANING PERFORMANCE MEASURES:

- 42. Nursing calves purchased or transferred in and grafted on to females in herd.
- 43. Total weaned calves.
- 44. Average age at weaning (months).*

**COW-CALF SPA ENTERPRISE SUMMARY OF GRAZING/
AND RAISED FEED ACRES AND FEED FED**

	Acres	Acres/Head Exp. Females
Grazing and Raised Feed Acres and Feed Fed Measures:		
45. Grazing land used for the cow-calf enterprise (11g+13g).**		
46. Crop aftermath used for the cow-calf enterprise (11f+12e+13f+14e).**		
47. Raised feed land used for the cow-calf enterprise (12f+14f).**		
48a. Total grazing and raised feed land (45+47).**		
48b. Acres per exposed female (48a/29).		
		Lbs./Ac.
49. Pounds weaned per acre of land (18d/48a).**		
		Lbs./Hd.
50. Pounds of raised/purchased feed fed per breeding cow (16).**		

COW-CALF SPA ENTERPRISE SUMMARY OF REPRODUCTION AND PRODUCTION PERFORMANCE

Reproduction Performance Measures Based on Exposed Females:		<u>Percent</u>
51.	Pregnancy Percentage ** (34b)	
52.	Pregnancy Loss Percentage ** (34b-38b)	
53.	Calving Percentage * (38b)	
54.	Calf Death Loss * $[(28+38a+42-43-27)/(29)] \times 100$	
55.	Calf Crop or Weaning Percentage * $[(43-42)/(29)] \times 100$	
56.	Female Replacement Rate Percentage ** (32)	
57.	Calf Death Loss Based on Number of Calves Born * $[(28+38a+42-43-27)/(28+38a)] \times 100$	
		Cumulative Distribution %
58.	Calving Distribution** (38c)	
	Beginning Calving Date 	
	(a) Calves born during first 21 days (38c.1/38a)	
	(b) Calves born during first 42 days (38c.1+38c.2)/38a	
	(c) Calves born during first 63 days (38c.1+38c.2+38c.3)/38a	
	(d) Calves born after first 63 days (38c.4/38a)	
Production Performance Measures:		Months
59.	Average age at Weaning in Months* (44)	
		Pounds/Head
60.	Actual Weaning Weights* (18)	
	(a) Bulls (18a)	
	(b) Steers (18b)	
	(c) Heifers (total weight 18c + 18b/head)	
	(d) Average Weaning Weight (18e)	
61.	Pounds Weaned per Exposed Female* (total weight 18e/29)	