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# Marketing protocols and capacity planning to maximize contribution margin

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## Introduction

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Most traditional strategies to determine an “optimum” marketing weight for swine focus on sub-system measurements such as revenue per pound, average sort loss, profit per pound, etc. The rationale for such approaches involves an assumption that these measurements are acceptable proxies for enterprise profitability, or that no direct “line-of-sight” exists between market weight and enterprise profitability, thereby forcing the use of some local measurement.

The goal of a pork production system is to maximize the profit of the total system. Targeting any lesser goal such as maximizing profit per pound, per pig, per load, per group, or per barn will not maximize the total system’s profit. In this document I will discuss this contentious statement and prescribe a simple marketing strategy that does indeed maximize the system’s total profitability.

## The marketing phase of a group

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As pigs in a group attain market weight, producers must decide between two alternatives: sell a load now versus sell later. When the finisher facility is needed by a new group being “pushed” out of a nursery that is itself being “pushed” out by incoming weaned pigs, the option to sell later does not exist and the question is moot. Therefore, let us consider initial loads sold from a group prior to group closeout. We will assume the marketing protocol is to top the group at least once prior to an all-out closeout.

It is essential in any such decision to consider only those revenues and expenses that are relevant to the decision. The concept of “relevance” being discussed here is consistent with the term’s accepted definition from management accounting: if a specific revenue or expense differs between the options, then it is relevant. Typically the overall enterprise will experience no difference in facility costs regardless of which initial-pull marketing alternative is chosen. Unless there is a per head per day finisher contract, the facility cost to the system will be the same either way and is, therefore, not relevant to the decision of whether to sell a load now vs. sell it later. In addition, all investments made in the pigs prior to this decision are irrelevant. On the other hand, both total revenue and total

feed expense will differ depending on the option chosen. Therefore, not surprisingly, these items are relevant.

The difference between incremental revenue and incremental expense—incremental contribution margin—represents the *only relevant data* on which to base this decision of whether to sell an initial load now or later.

Consequently, our original objective of determining optimum market weight really splits into two issues:

- Determining the weight and protocol for initial load sales that maximizes contribution margin
- Nursery/finisher capacity planning to economically minimize the forgone contribution margin from the remaining loads at group closeout

## Related issues

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The impact of “topping” a barn on the remaining pigs and placement sorting strategies that reduce negative effects of later topping do not seem to be well understood. “Topping” should mean to remove those pigs whose incremental contribution margin will no longer be positive. However, this could have an offsetting negative impact on the pigs left behind as their growth stalls due to resocialization. Others claim that remaining pigs benefit from increased space. Should initial stocking be with regard to size or should pens contain the full weight range so later topping of the barn would equate to topping of pens? These questions, though valid and of obvious significance to the marketing strategies being discussed here, are beyond the scope of this document. When and if their impact on revenue and feed cost for remaining pigs can be quantified, then these additional relevant revenues and expenses should be considered according to the strategy this document presents.

## Packer grids and incremental revenue

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The only issue concerning a kill sheet and the packer grid behind it that pertains to our decision of sell a load now vs. sell it later is the difference in the total revenue paid by the packer if the sale is deferred. Other data reported on the kill sheet such as sort loss, premium, yield, percent lean, etc. are not useful in making this decision. This

Table 1: Incremental contribution margin (revenue less feed expense) for several loads

Head	Average Live Weight (lb)	Approximate incremental contribution margin from deferring sale by 1 week
173	290	\$96.30
164	262	457.02
170	288	137.19
164	275	266.36

analysis is greatly enabled by the availability of individual carcass data. Consider **Table 1** that depicts the incremental contribution margin (revenue less feed expense) for several loads.

The methodology applied in **Table 1** is quite straightforward. Since the carcass weight and percent lean are known for each pig in each load, the pigs can individually be “grown” for an additional week (heavier carcass and less lean). This load can then be virtually “re-sold” by applying the packer grid to the individual animals. Obviously some animals incur more severe weight discounts and some fall into a different cell in the (carcass weight, percent lean) matrix for premiums. Similarly, additional feed is consumed during this additional week at some cost. This analysis clearly requires a good understanding of the ADG and FG performance of the pigs at these weights. Absolute precision, however, is not essential.

Note that the leaner the pigs, the heavier the weight before incremental contribution margin decreases to zero. This is due to the dynamic between premiums and heavy weight discounts.

The cost of money in deferring a sale is quite small. However, the credibility of this discussion would suffer if it were ignored here. In **Table 1**, the 170-head row shows additional contribution margin of \$137 for a one-week sale deferral. The revenue that would have been realized if sold at 288 pounds was, say, \$20,000. That represents a 35% annualized rate of return on a \$20,000 investment. Most investors would be happy with such a decision.

## Capacity planning

Clearly, facility costs are not to be totally ignored. Their relevance, however, is in the cost of providing growing

space capacity to the overall system rather than at the load or group level. Using the above approach for determining incremental contribution margin, one can easily sum the contribution margin forgone during a one-year or five-year period from the loads sold at group closeout. Next, calculate what this forgone contribution margin would have been if additional capacity existed in the system. How does this difference compare to the cost of providing that additional capacity?

In this particular exercise, one can observe the impact of surges and ebbs in weaned pig production on the strategy of maximizing the number of loads that achieve full contribution margin relative to the cost of capacity. The conflict centers around having enough capacity vs. not having too much. This is a classic manifestation of the more generic conflict: protect contribution margin vs. control costs. From this perspective one can appreciate and quantify the value to the system from reduced variation in weaned pig production over time.

## Conclusion

We can partition loads sold from groups of pigs into first pulls, middle pulls, and closeouts. Traditional marketing strategies often have been confused by the consideration of facility costs and other irrelevant costs or revenues. The strategy that results in maximum contribution margin captured by the system and therefore maximum enterprise profitability is to focus on realizing full contribution margin from first and middle-pull loads. Capacity planning and pig flow management are subordinated to this decision and balance the cost of additional capacity or intervention compared to the reduction in forgone contribution margin that is thereby enabled.

