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AGRIBUSINESS SIMULATORS FOR MANAGEMENT TRAINING

Emerson M. Babb

Abstract

This paper describes four agribusiness simulators which can be processed on a microcomputer for use in undergraduate and extension teaching. The simulators model the environment in which supermarket chains, farm supply centers, and cooperative and proprietary grain elevators compete for business. Instruction manuals, user's manuals, and a diskette are distributed for each simulator. Each diskette contains programs to enter and edit team decisions, to process decisions and print reports, and to create graphs of team performance. The simulators can be used to teach financial management concepts and techniques, as well as economic principles.

Key words: agribusiness, simulator, microcomputer, management game.

Simulators (management games) have been used for more than 25 years to teach economic and business topics to persons in collegiate, extension, and industrial training programs. In the past, the use of simulators was restricted to those who had access to a mainframe computer and required programmers or others who could install the software. Teaching was usually done at the location of the computer and simulator use had to conform with established processing procedures. With the widespread availability of microcomputers, simulators can now be used by a much broader group of teachers and in more flexible teaching frameworks.

Brief comments about the use of simulators are made here since reviews of early applications (Babb and Eisgruber) and contemporary evaluations (Siegfried and Fels) are available. Simulators represent an extension of case study methods of teaching. Students normally make a sequence of decisions where changing market conditions, competitors' behavior, and other factors must be considered. There is feedback from each set of infor-

mation from earlier decisions. In contrast, case studies are usually static.

Simulators have generally been found to be effective for teaching (Wolfe), but their benefits must be considered in relation to additional student time requirements and costs (Schriesheim and Schriesheim). They have been used to teach concepts and practices of management, planning techniques, organization principles, and characteristics of an industry. Simulators can be used as a laboratory to reinforce abstract principles and concepts being taught. The purpose of this article is to describe four microcomputer software packages which can be used by agricultural economists in undergraduate and extension teaching.

COMPUTER PROGRAMS

The four software packages are: supermarket chain simulator, farm supply center simulator, and grain elevator simulator (cooperative and proprietary firm versions). Each simulator models the environment in which firms (teams of students) compete for business. Each software package consists of a notebook containing an instruction manual for students, a user's manual for the teacher and/or person inputting team decisions, a quick reference guide, a set of blank forms (decision form, cash budget, and profitability model), and a diskette.

The diskette for each simulator contains three programs which are accessed by the user, plus other programs which are linked to the primary programs that require no action on the part of the user. The first program is used for entering and editing decisions made by teams. The second program is used for processing decisions and printing results. The third program creates graphs of team performance which can be printed from the

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screen and used to make transparencies. The supermarket chain simulator diskette contains an additional program which creates files for storing team performance data for graphing directly on a color plotter. The graphics programs provide the teacher with visuals which demonstrate the impacts of decisions made by teams. These software have a similar structure and were designed to operate much the same. Experience with the use of one simulator will carry over to another.

All computer programs are written in BASIC for an IBM personal computer with 64K of memory and two disk drives. Other computers that use software compatible with the IBM-PC may also be used. The IBM disk operating system (DOS) version 2.0 or 2.1 or equivalent for other DOS is required for use with the graphics programs. The supermarket chain simulator is distributed in compiled BASIC and requires 256K of memory.

Development

Information used to construct the simulators came from a variety of sources including: prior studies of demand and firm operating costs, reports published by trade associations, engineering departments of cooperating firms, and surveys and interviews of firm managers. The physical and cost relations should be representative of midwestern firms. For relationships such as advertising response, the judgments of persons in the industry were used. The market demand for commodities such as meat was based on prior research. There was no empirical basis for specifying the sales response to unilateral price changes by firms; e.g., one team reduces price while others make no change. Again, conventional wisdom of those in the industry was used. Demand relations in the simulators are somewhat like those in a prisoner's dilemma game. That is, the sales response for a firm to its unilateral price change is much greater than for the same price change by all firms. The price elasticity for a unilateral price change is greater than for joint action by all firms (market demand). Response coefficients and other relationships used in the simulator are described in the user's manual. In some cases, the teacher may modify the coefficients and/or the environment in which teams compete.

Testing

Each simulator has been tested extensively. The software was tested for ease of use by a variety of users including relatively naive subjects. The programs employ prompts and menus to guide the user through data entry and processing and contain many data entry and other checks. The supermarket chain simulator has been tested in about 30 seminars for over 1,000 persons from the food retailing industry and in two large undergraduate classes in financial management. The grain elevator simulator has been tested with about 90 grain elevator managers. The farm supply center simulator has been tested in two undergraduate classes and in extension workshops.

The simulators can be used to teach business planning techniques, economic and business principles, and characteristics of the industry and firms in it. They are especially designed to teach financial management and to demonstrate the impacts of different business strategies.

SUPERMARKET CHAIN SIMULATOR

The supermarket chain simulator models the market environment in which food retailing chains of six stores (can be varied) compete for sales (Babb and Leburg, 1984a). Each store is organized into six departments: grocery, meat, dairy, produce, frozen food, and general merchandise. There are 26 operating decisions for one supermarket for 1 week which involve margins, promotions, specials, orders, and people. There are six quarterly decisions for the chain concerning remodeling, opening new stores, investments, and loans. Financial results for all stores are projected on a quarterly basis.

Team decisions are recorded on a decision form for creation of data files using the editor program, Table 1. The editor prompts for each input and team decisions are entered directly from the decision form. When data entry is completed, decisions can be processed by the simulator. The results (simulator output) returned to teams consist of an operating statement, balance sheet, ratio analysis, report of inventory and stock turn, labor analysis, and a market report containing the shares of competing chains and margins, promotional activities, and other policies of competitors, Table 2. These results are used for

the next decision made by teams. The teacher may also request (optional) a report which summarizes key performance variables for all teams. This provides an overview of performance for the class and identifies teams which may need assistance. A report of the input data (team decisions) and values of response coefficients calculated for each team may also be requested. Graphs of team performance

TABLE 1. SAMPLE INPUT FOR SUPERMARKET CHAIN SIMULATOR

SUPERMARKET CHAIN SIMULATOR DECISION FORM								
Market Area Nu					_		_	
Firm (Team) N								
Quarter Number								
MARGINS ^a	<u> </u>							
Grocery (percent)	±4	1	7 •	0				
Meat (percent)	±4	2	₹ •	• ō				
Dairy (percent)	±4	ī	<u> </u>	• 0				
Produce (percent)	±4	$\frac{1}{2}$ $\frac{1}{3}$	Ź.	5				
Frozen food		_	_	_				
(percent)	±4	2	4 •	- 5				
General merchandise		=	-	_				
(percent)	±4	3	4	0				
PROMOTIONS		_	-	-				
Stamps (percent of								
sale)	0, 2.2 to 4.4	0	• 0)				
Double coupons	0=no, 1=yes	ŏ	ž	•				
Advertising (dollars)	0 110, 1 ,00		2 9	0 0)			
Store hour policy		-	= :	<u> </u>	_			
(number)	1,2,3	2						
SPECIALS	1,2,3	=		,				
Grocery (number)	0 to 40	1	5					
Meat (number)	0 to 20	<u> </u>	-					
Dairy (number)	0 to 10	_	ź					
Produce (number)	0 to 10	_	Ź					
Frozen food	0 10 10	-	-					
(number)	0 to 10		4					
General merchandise	0 10 10	_	<u> </u>					
	0 to 10		h					
(number) ORDERS	0 10 10	_	<u>4</u>					
		5	Λ.	n 1	`	Λ		
Grocery (dollars)		<u></u> ∻	$\frac{0}{1}$	ž	÷	<u>0</u>		
Meat (dollars)		-	+ }	ž ?	÷	×		
Dairy (dollars)		ż	÷ ;		ť	≚		
Produce (dollars)		52 1 6	<u>0</u>		ť			
Frozen food (dollars)		5	⊻ :	7 7	_			
General merchandise		=	^		`			
(dollars)		· <u>5</u>	<u>0</u> !	0 9	_			
PEOPLE								
Persons in meat	4	0						
department (FTE's)	4 or more	8				٠		
Persons in rest of	10		_					
store (FTE's)	10 or more	1	<u> </u>					
Persons part-time			_					
(FTE's)	<60%	1	5					
FACILITIES								
Remodel store		_						
(number)		<u>o</u>						
Open new store		_						
(number)		<u>o</u>						
MONEY								
Borrow money							_	
(dollars)b			_		_	_	0	
Repay loan (dollars)		_			_	_	<u>0</u>	
Make investment							_	
(dollars)		_	_		_	_	0	
Call investment								
(dollars)			_		_	_	0	

Maximum and minimum margins for the next quarter are shown at the bottom of your market share report.
 The maximum amount which can be borrowed next quarter is shown at the bottom of your performance report.

may be requested and consist of such items as comparative team sales, profits, net worth, gross margins, total expenses, wage expense, market share (line and pie graphs), and composite performance of individual teams.

FARM SUPPLY CENTER SIMULATOR

The farm supply center simulator models the environment in which firms sell feeds, fertilizers, and various services and purchase grain from farmers (Babb and Leburg, 1984b). Each team makes 41 decisions including price levels for products and services, quantity and quality discounts, hog and layer contracting, personnel, product orders, equipment purchases, facility expansions, loans, and investments. Decisions are made for a 1-year period. For each decision period, teams are given a market news sheet which contains information about cost of goods, grain market prices, and news items which are expected to influence their volume of business, prices, or profitability.

The results from decisions consist of an operating statement, balance sheet, ratio analysis, efficiency report, contracting report, inventory report, and market information relating to market shares, prices, and other policies of competitors. As in the case of the supermarket chain simulator, optional reports may be obtained for the teacher, including graphs of team performance.

GRAIN ELEVATOR SIMULATOR

The grain elevator simulator models the environment in which firms compete for the purchase of corn and soybeans from farmers (Babb and Leburg, 1984c). There are two version of this simulator with separate software packages. One version models competition among cooperative firms and embodies the unique financial and tax features of cooperatives. The other models competition among proprietary firms. Each team makes decisions concerning the purchase prices of grain at various times during the year, drying and storage charges, grain contracting at harvest and from farm storage, storage of company owned grain, discounts, facilities expansions (truck, dryer, and storage), investments, loans, and equity capital. Decisions are made for a 1-year period, but involve seasonal flows of grain and cash. For each decision period, teams are given a mar-

TABLE 2	CARAMETE .	OUTTOUT FOR	STIPERMARKET	CHAIN	CINATU ATVOT

Meat 24,716 21.2 1,927,88* Dairy 12,990 11.1 1,013,19* Produce 8,263 7.1 644,514 Frozen food 6,056 5.2 472,33* General merchandise 5,928 5.1 462,39* Total \$116,708 100.0 \$9,103,18* Cost of goods sold Grocery 49,682 3,875,23* Meat 20,650 1,610,67* Dairy 10,798 842,21* Produce 5,971 465,76* Frozen food 4,718 367,99* General merchandise 4,088 314,95* Gross margin Grocery 9,072 15,4 707,63* Gross margin Grocery 9,072 15,4 707,63* Gross margin Grocery 9,072 15,4 707,68* Gross margin Grocery 9,072 15,4 707,68* Gross margin Gross margin 1,083 22,1 17,476,83* <tr< th=""><th>TRADE</th><th>AREA 1 F</th><th>RM 1 STATEM</th><th></th><th>RTER 1</th><th></th></tr<>	TRADE	AREA 1 F	RM 1 STATEM		RTER 1	
Grocery	SALESdollare		W	eek'	Percent	Quarter
Meat 24,716 21.2 1,927,885 Dairy			5	8,755	50.3	4,582,871
Produce 8,263 7.1 644,515 Frozen food 6,056 5.2 247,33 General merchandise 5,928 5.1 462,394 fotal \$116,708 100.0 \$9,103,188 Cost of goods sold Grocery 49,682 3,875,23 Meat 20,650 1,610,679 Dairy 10,798 842,211 Produce 5,971 465,799 General merchandise 4,038 314,951 Forzen food 4,718 367,991 Gross margin 367,992 5,877 82.1 \$7,476,831 Gross margin 367 95,857 82.1 \$7,476,831 Gross margin 367 95,857 82.1 \$7,476,831 Gross margin 367 1,677 1,65 317,201 Meat 4,067 16.5 317,202 Dairy 2,192 16.9 170,977 Forzen food 1,338 22.1 104,333 General merchandise					21.2	1,927,885
Frozen food 6,056 5,2 472,33; General merchandise 5,928 5,1 462,39; General merchandise 40,682 3,875,23; Meat 20,650 1,610,67; Dairy 10,798 842,211 Produce 5,971 465,76; Frozen food 4,718 367,99; General merchandise 4,038 314,95; Gross margin 5,95,857 82,1 \$7,476,83; Gross margin 6,000 1,338 22,1 Gross margin 7,476,83; Gro					11.1	1,013,195
General merchandise					7.1	644,510
State Stat	Frozen food			6,056	5.2	472,332
Cost of goods sold Grocery	General merchandise.			5,928	5.1	462,396
Grocery 49,682 3,875,232 1,610,671 Dairy 10,798 842,211 Produce 5,971 465,76 General merchandise 4,038 314,955 Gross margin Grocery 9,072 15,4 707,633 Gross margin 1,338 22,1 104,33 General merchandise 1,890 31,9 170,97 Frozen food 1,338 22,1 104,33 General merchandise 1,890 31,9 147,44 Frozen food 1,338 22,1 104,33 General merchandise 1,890 31,9 147,44 Grotal	fotal		\$11	6,708	100.0	\$9,103,188
Meat	Cost of goods sold					
Dairy						3,875,232
Produce						
Frozer food 4,718 367,991	•					
General merchandise						
Social S						
Gross margin Grocery 9,072 15.4 707,631 Meat 4,067 16.5 317,207 Dairy 2,192 16.9 170,977 Produce 2,292 27.7 178,749 Frozen food 1,338 22.1 104,33 General merchandise 1,890 31.9 147,444 Total \$20,851 17.9 \$1,626,344 Operating expenses Wages and fringes 11,673 10.0 910,499 Advertising expense 0 0.0 1.0 93,600 Stamp expense 0 0.0 1.0 93,600 Stamp expense 0 0.0 1.0 93,600 Other expense 3,163 2.7 246,733 Non controllable 4,841 4.2 377,586 Total \$20,877 17.9 \$1,628,411 Net operating profit	General merchandise			4,038		314,953
Grocery 9,072 15.4 707,63: Meat 4,067 16.5 317,20' Dairy 2,192 16.9 170,97' Produce 2,292 27.7 178,74' Frozen food 1,338 22.1 104,33' General merchandise 1,890 31.9 147,44' Total \$20,851 17.9 \$1,626,34' Operating expenses Wages and fringes 11,673 10.0 910,49' Advertising expense 0 0 0.0 1.0 93,60' Stamp expense 3,163 2.7 246,73' Non controllable 4,841 4.2 377,58' Total \$20,877 17.9 \$1,628,41' Net operating profit −26 −0.0 \$−2,06' Other expense 3,163 2.7 246,73' Non controllable 575 0.5 44,86' Grand opening cost Investment income 16,00' Interest cost 56,16' Total net profit at 549 0.47 −7,36' Income tax Total net profit at 549 0.47 −7,36' Income tax Total net profit at 549 0.47 −7,36' Non customers 7762 BALANCE SHEET ASSETS Cash No. stores open 7763. Cash 763,770 Accounts payable 1,094,70' Accounts receivable 494,705 Other debt 404,705' Inventory 1,398,859 Friendly finance 1,194,70' Inventory 1,398,859 Friendly finance 1,194,70' Current assets 2,957,333 Current liabilities 1,529,41' Fixtures and equip 2,060,004 Bank note 1,170,00' Other assets 74,705 Total liabilities 1,529,41' Fixtures and equip 2,060,004 Bank note 1,170,00' Other assets 74,705 Total liabilities 2,392,63' Total assets 5,092,043 Total Liab + equity 5,092,04' Asset turnover 7,15 At return on total assets −0.5 GENERAL INFORMATION—FOR REPRESENTATIVE WEEK AND STORE Annual String 1,094,70' Annual String 1,094,70' Frozen food 0,053 1057 7,391 8,032 33.2 33.2 33.2 33.2 33.2 33.2 33.2 3	Total		. 89	5,857	82.1	\$7,476,839
Meat						
Dairy						707,638
Produce						317,207
Frozen food						
General merchandise						
State Stat						
Wages and fringes						
Wages and fringes 11,673 10.0 910,49 Advertising expense 1,200 1.0 93,60 Stamp expense 0 0.0 93,60 Other expense 3,163 2.7 246,73 Non controllable 4,841 4.2 377,58 Iotal \$ 20,877 17.9 \$ 1,628,41 Not operating profit -26 -0.0 \$ -2,06 Other income 575 0.5 44,86 Grand opening cost 56,16 600 Investment income 6,00 6,00 Income tax 549 0.47 -7,36 Income tax -7,36 -0.08 Income tax -7,36 -0.08 Income tax -7,36 -0.08 Rotal net profit at -7,36 -0.08 Income tax -7,36 -0.08 Sales per square feet 6.48 No. stores open No. customers 763,770 Accounts payable 1,094,70 Market securitites <td< td=""><td></td><td></td><td>. \$2</td><td>0,851</td><td>17.9</td><td>\$1,626,349</td></td<>			. \$2	0,851	17.9	\$1,626,349
Advertising expense 1,200 1.0 93,60			1	1 673	10.0	910 492
Stamp expense						
Other expense 3,163 2.7 246,73 Non controllable 4,841 4.2 377,58 Total \$ 20,877 17.9 \$1,628,41 Net operating profit -26 -0.0 \$ -2,06 Other income 575 0.5 44,86 Grand opening cost Investment income 6,00 Investment income 56,16 Total net profit bt 549 0.47 -7,36 Income tax -7,36 -0.06 Sales per square feet 6.48 No. stores open No. customers -762 BAIANCE SHEET LIABILITIES AND EQUITY Cash 763,770 Accounts payable 1,094,70 Market securities 300,000 Principal payable 30,00 Accounts receivable 494,705 Other debt 404,705 Inventory 1,398,859 Friendly finance Frixtures and equip 2,060,004 Bank note 1,170,00 Other assets 74,705 Total liabilities 2,699,41 N						0
Non controllable						
Net operating profit						377,586
Other income	Total		. \$ 2	0,877	17.9	\$1,628,413
Grand opening cost Investment income 6,000 56,16	Net operating profit			-26	-0.0	
Investment income				575	0.5	44,861
Interest cost						0
Income tax						56,165
Income tax	Total net profit bt			549	0.47	-7,368
Total net profit at pct						. 0
BALANCE SHEET LIABILITIES AND EQUITY	Total net profit at					-7,368
No. customers	Total net profit at pct					-0.08
BAIANCE SHEET	Sales per square feet		N	lo. stor	es open	6
ASSETS	No. customers	7762				
Cash 763,770 Accounts payable 1,094,70 Market securities 300,000 Principal payable 30,000 Accounts receivable 494,705 Other debt 404,705 Inventory 1,398,859 Friendly finance 1,529,411 Current assets 2,957,333 Current liabilities 1,529,411 Fixtures and equip 2,060,004 Bank note 1,170,000 Other assets 74,705 Total liabilities 2,699,41 Non-current assets 2,134,709 Equity 2,392,63 Total assets \$5,092,043 Total Liab + equity \$5,092,04 RATIO ANALYSIS (ANNUALIZED) Current ratio 1.93 At return on total assets -0.5 Debt to equity 1.13 Leverage factor 2.1 At profit pet -0.08 At return on inv. cap 4.8 GENERAL INFORMATION—FOR REPRESENTATIVE WEEK AND STORE Annual Stock Shrink Inventory 4.8 General intent pet. Stock-out Ave	ASSETS	BALANC	E SHEE		LITIES AND	EOUITY
Market securities 300,000 Principal payable 30,00 Accounts receivable 494,705 Other debt 404,705 Inventory 1,398,859 Friendly finance 1,529,411 Current assets 2,957,333 Current liabilities 1,529,411 Fixtures and equip 2,060,004 Bank note 1,170,00 Other assets 74,705 Total liabilities 2,699,41 Non-current assets 2,134,709 Equity 2,392,63 Total assets \$5,092,043 Total Liab. + equity \$5,092,04 RATIO ANALYSIS (ANNUALIZED) Current ratio 1.93 At return on total assets -0.5 Debt to equity 1.13 Leverage factor 2.1 At profit pct -0.08 At return on equity -1.2 Asset turnover 7.15 At return on inv. cap 4.8 GENERAL INFORMATION—FOR REPRESENTATIVE WEEK AND STORE Annual Department pct. Stock-out Average Ending turns Grocery 0.51 0 <		763,770	Acco			
Accounts receivable	Market securities					30,000
Current assets 2,957,333 Current liabilities 1,529,410	Accounts receivable	494,705				
1,170,000 1,17	Inventory		Frien	idly fin	ance	0
1,170,000 1,17	Current assets	2,957,333	Curr	ent lial	oilities	1,529,410
RATIO ANALYSIS (ANNUALIZED) Stock-out Average Ending turns	Fixtures and equip		Bank	note .		
Non-current assets 2,134,709 Equity 2,392,63 Total assets 55,092,043 Total Liab. + equity \$5,092,04 RATIO ANALYSIS (ANNUALIZED) Current ratio 1.93 At return on total assets -0.5 Debt to equity 1.13 Leverage factor 2.1 At profit pct -0.08 At return on equity -1.2 Asset turnover 7.15 At return on inv. cap 4.8 GENERAL INFORMATION—FOR REPRESENTATIVE WEEK AND STORE Annual Shrink Inventory Stock Department pct. Stock-out Average Ending turns Grocery 0.51 0 148,899 149,058 17.4 Meat 4.18 0 26,615 26,790 40.3 Dairy 0.78 0 18,151 18,252 30.9 Produce 5.25 0 6,144 6,159 50.5 Frozen food 0.53 1057 7,391 8,032 33.2	Other assets	74,705	Total	liabili	ties	2,699,410
RATIO ANALYSIS (ANNUALIZED) Current ratio	Non-current assets					
RATIO ANALYSIS (ANNUALIZED) Current ratio	Total assets	\$5,092,043	Total	Liab.	+ equity	\$5,092,043
Current ratio 1.93 At return on total assets -0.5				• • • • • • • • • • • • • • • • • • • •		
At profit pet0.08 At return on equity1.2 Asset turnover 7.15 At return on inv. cap 4.8 GENERAL INFORMATION—FOR REPRESENTATIVE WEEK AND STORE Shrink			At re	turn or	total asset	
At profit pet0.08 At return on equity1.2 Asset turnover 7.15 At return on inv. cap 4.8 GENERAL INFORMATION—FOR REPRESENTATIVE WEEK AND STORE Annual Stock Inventory Stock Inventory Stock Inventory 100 148.899 149.058 17.4 Meat 4.18 0 26,615 26,790 40.3 Dairy 0.78 0 18,151 18,252 30.9 Produce 5.25 0 6,144 6,159 50.5 Frozen food 0.53 1057 7,391 8,032 33.2	Debt to equity	1.13				
GENERAL INFORMATION—FOR REPRESENTATIVE WEEK AND STORE Annual	At profit pct					
Shrink Shrink Stock-out Alexand Stock Shrink Stock-out Stock Shrink Stock-out Stock Stock	Asset turnover	7.15	At re	turn or	inv. cap	4.88
Department Grocery O.51 August 10 A			REPRESE	NTATI	VE WEEK	ND STORE
Department pct. Stock-out of Grocery Average of Grocery Ending of Lurns turns Meat 4.18 0 26,615 26,790 40.3 Dairy 0.78 0 18,151 18,252 30.9 Produce 5.25 0 6,144 6,159 50.5 Frozen food 0.53 1057 7,391 8,032 33.2						
Grocery 0.51 0 148,899 149,058 17.4 Meat 4.18 0 26,615 26,790 40.3 Dairy 0.78 0 18,151 18,252 30.9 Produce 5.25 0 6,144 6,159 50.5 Frozen food 0.53 1057 7,391 8,032 33.2						
Meat 4.18 0 26,615 26,790 40.3 Dairy 0.78 0 18,151 18,252 30.9 Produce 5.25 0 6,144 6,159 50.5 Frozen food 0.53 1057 7,391 8,032 33.2						
Dairy 0.78 0 18,151 18,252 30.9 Produce 5.25 0 6,144 6,159 50.5 Frozen food 0.53 1057 7,391 8,032 33.2						
Produce 5.25 0 6,144 6,159 50.5 Frozen food 0.53 1057 7,391 8,032 33.2						
Frozen food 0.53 1057 7,391 8,032 33.2						
Gen. merchandise 0.50 0 24,371 24,852 8.6						
	Gen. merchandise	0.50	0	24,3)/1 24,	852 8.6

\$1057 \$231,572 \$233,143 \$21.5

\$1960

LABOR ANALYSIS REP	ORT—F					
		Sales	per Ho	ours	Hours	Number
	Sales	hou	ır requ	aired a	vailable	of
		worl	red			persons
Meat dept	24,716	99.	.6	248	320	- 8
Rest of store	91,991	66.		378	680	17
Part time					600	15
Total store \$	116,708	71.	.8 1,0	626	1,600	40
				ă.		Labor
	Hours p		Labo	r Cost	Total	pct.
		Over-		Over-	labor	of total
	egular	time	Regular		cost	sales
Meat persons	320	0	2,880	0	2,880	2.5
Store persons	680	98	4,760	1,033	5,793	5.0
Part time	600		3,000		3,000	2.6
Total	,600	98	10,640	1,033	11,673	10.0
Labor image factor	0.996	Pror	notional	carryove	r factor	0.982
Tax loss carryover					next qtr.	
		• • • • • • • • • • • • • • • • • • • •				
			EPORT			
TRA	DE AREA	1	QUA	RTER 1		
			Firm 1	l	Firn	n 2
Share of market					-	
Grocery			50.0			0.0
Meat			50.0		-	0.0
Dairy			50.0			0.0
Produce			50.0			0.0
Frozen food			50.0			0.0
Gen. merchandise		****	50.0)		0.0
Total		••••	50.0)	50	0.0
Initial margins						
Grocery			17.0			7.0
Meat			22.0			2.0
Dairy			19.0			9.0
Produce	••••		34.5			£.5
Frozen food			24.5			1.5
Gen. merchandise	•••••		34.0)	34	1.0
Number of specials						
Grocery			15.0)	1	5.0
Meat			7.0			7.0
Dairy			4.0)		1 .0
Produce	,		4.0)		i .0
Frozen food			4.0)	4	1 .0
Gen. merchandise		••••	4.0)	•	i .0
Other policies						
Advertising			1,200.0)	1200	
Double coupons			n			n
Stamps			0.0			0.0
Store hours			2.0			2.0
Remodel store			0.0	0	(0.0
Stores open			6.0	0		5.0
Average initial margin les	vale for t	ne mael	rot Mo	regin ean	ge for nex	t anaetae
Average initial margin le					.0 - 21.0	. quarter
Meat					.0 - 26.0	
					.0 - 23.0	
Dairy						
Produce					.5 - 38.5	
Frozen food					.5 - 28.5	
General merchandis	e	34.0) 	30	.0 - 38.0	

ket news sheet which contains information about cash and futures prices at various times of the year and news items which might affect volume of grain, prices, and margins.

Output from the simulator consists of an operating statement, balance sheet, ratio analysis, detailed report of grain transactions and flows through the year, utilization report, finance report, and market information relating to market crop and price reports, market shares, and prices and policies of rivals. Optional reports and performance graphs may also be obtained.

Total

Total shrink dollars

AVAILABILITY

All of the programs and materials for the four simulators have been copyrighted by the Purdue Research Foundation and are being distributed to departments (units) of educational institutions under a license agreement which restricts use to classroom and

extension teaching under the auspices of the institution. The cost of the software package for each simulator is \$100 and should be ordered from: Publication Distribution, Department of Agricultural Economics, Purdue University, West Lafayette, IN 47907. Checks or purchase orders should be made to Purdue University.

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