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ECONOMIC ASPECTS OF ADVERTISING IN AGRICULTURE: A REVIEW

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Abstract

In a dynamic world of change, promotion of agricultural commodities will inevitably become more important, particularly with respect to intensification in the nature of competition, the complexity in distribution and differences between consumer and producer prices. The impact of advertising as a means of promoting agricultural commodities, have to be evaluated in terms of consumer response and the effectiveness of advertising agricultural products, by assuming that advertising can increase the level of sales at any given price by shifting the demand curve for a specific product to the right, or increase the price or both. Although South Africa is a part of Africa, it has a highly developed and sophisticated marketing structure which necessitates the analysis and decomposition of foreign advertising research done in Europe and America for possible application in South Africa, due to the virtually non-existence of research on generic or brand advertising of agricultural products in South Africa. Empirical research on the effects of advertising generally indicates a positive effect on sales that continues beyond the time of initial advertising. Most analyses considering the effect of advertising on consumer demand for agricultural commodities have pragmatically focused on single-equation demand relations using aggregate data. However, limitations of the single equation approach exists. In general, empirical evidence shows that brand advertising is more efficient than generic advertising ing.

Uittreksel

Ekonomiese aspekte van advertensiewese in die landbousektor: 'n Oorsig

Promosie van landboukommoditeite sal onafwendbaar belangriker word in 'n dinamiese wêreld, veral met betrekking tot intensifikasie in die aard van mededinging, die kompleksiteit van landboubemarking en die verskille tussen produsente- en verbruikerspryse. Die impak van advertensies as 'n metode om landboukommoditeite te bevorder, behoort ontleed te word aan die hand van die verbruiker se vraag, sowel as produsente se aanbodreaksies, met die aanname dat advertensies die vraag na 'n spesifieke produk sal laat toeneen, dat dit pryse sal laat styg of beide. Alhoewel Suid-Afrika deel is van Afrika het dit 'n hoogs ontwikkelde en gesofistikeerde bemarkingstruktuur. Dit noodsaak die ontleding en bestudering van navorsing gedoen in Europa en Amerika vir moontlike toepassing in Suid-Afrika, weens die gebrek aan navorsing oor generiese of handelsmerk advertensies in Suid-Afrika. Oor die algemeen is daar deur empiriese navorsing bevind dat deur te adverteer, verkope positief beïnvloed kan word en dat die reaksie op die advertensie verder strek as slegs die blootstellingstydperk. Die meeste ontledings van die effek van advertensies op verbruikersvraag is pragmaties op enkelvoudige vraagfunksies toegepas met saamgevoegde data. Die enkelvergelyking benadering het egter beperkings. Oor die algemeen is bevind dat generiese advertensies van landbouprodukte minder effektief is as advertensies gekoppel aan 'n spesifieke handelsmerk.

1. Introduction

Advertising agricultural products is certainly not a new phenomenon. In the dynamic changing world, the international decline in the per capita consumption of various agricultural products gave rise to the problem of unknown future demand for various farm products. This lead to increased commodity advertising as a marketing tool in promotion programs of agribusiness industries and marketing boards. Lee et al (1989) state that the proliferation of private and of public strategies and programs, constitutes an effort to expand the demand for farm products through promotion and advertising in both domestic and foreign markets. Strategies and programmes range from brand advertising activities by major retailers and food manufacturers, to generic promotional and advertising programs of agricultural commodity groups, such as marketing boards. However, the impacts thereof as a means of promoting agricultural commodities have to be evaluated in terms of consumer response and also the effectiveness of advertising agricultural products. It is assumed that advertising can increase the level of sales at any given price or increase the price, or both, by shifting the demand curve for a specific product to the right. Advertising can also make the demand curve more inelastic so that if the price of the product rises, less switching to substitute products is likely (Morrison, 1984).

Proposed structural changes in South Africa's marketing environment of agricultural commodities give rise to questions about the effects of advertising on producers, consumers, taxpayers, the specific industry and policy makers:

Do producer-funded generic promotion schemes enhance producer welfare?

- Does advertising cause misallocations of productive resources in that consumers are manipulated in such a way that they are unable to exercise preferences rationally?
- Does advertising cause consumer prices to increase?
 Does advertising increase the number of brands of related products?
- Does the existence of advertising lead to a smaller number of competitors than what would be the case without advertising and even create monopolies?
 - Does advertising contribute to economic welfare, or
- do the costs of advertising exceed the benefits?
- What is more efficient in agriculture: generic, brand or no advertising?

The main question is however whether the advertising mode of agricultural commodities (brand or generic advertising) will move the demand curve sufficiently. The generally accepted idea "brand named products have a better chance of success than generic products" leads to an analysis of policy controls, due to the fact that some control measures of South Africa's marketing policies have forced some commodities to become generic products. This may restrict or even prevent successful promotion policies, due to uncoordinated market packages, including distribution and display.

2. The role of advertising

The basic advertising theory was set as "a firm which can influence the demand for its product by advertising, in order to maximise its profits, will choose the advertising budget and price such that the increase in gross revenue resulting from one unit of increase in advertising expenditures are equal to the or-

dinary elasticity of demand for the firm's product" (Dorfman and Steiner, 1954:826), implying that the marginal opportunity costs of sales are equal to the marginal productivity of advertising. In general, advertising is directed towards the existing and potential consumers of a product with the ultimate objective of enhancing sales for the advertised product (Lancaster, 1966).

However, advertising farm products is not without controversy (Cowling et al, 1975; Albion and Farris, 1981; Groenewald, 1982; Strak, 1983; Hessner and Mellor, 1986; Jensen et al 1989; etc.). According to Kihlstrom and Riordan (1984), advertising can signal quality only if higher quality firms find it profitable to invest in relatively more advertising than do lower-quality firms, and conversely. If advertising costs are the same for all brands, the returns to advertising are greater for higher quality products. Schmalensee (1978) found that low-quality firms advertise more profitably than the high-quality firms. The question arises: Who should bear the cost of advertising: primarily producers or the food industry itself? This involves the choice between generic and brand advertising. Controversy with respect to agricultural product promotion necessitates the testing of advertising effectiveness on a separate product/market base. Various marketing boards, acts and protection schemes regulate agricultural marketing world-wide, due mainly to agricultural characteristics, a lack in effective distribution systems, a production orientated farming community and agricultural policy, small numbers of participants in the marketing sys-tem, droughts and changing economic environments. Today, the primary objective of most agricultural marketing boards is to improve income from and prices of their products. However, this is not the only objective.

Most economists would argue that two important factors underlying the consumer's choice are his or her preferences and the information available (Lee *et al.*, 1989). In addition, some economists have argued that advertising can in turn be considered as a source of information (Verma, 1980) and a determinant of preferences. Generally, the literature regards the effects of advertising or promotions as a process occurring in distinct stages. First, enhancing the consumer awareness of the product, secondly a change in consumer attitudes toward the product and finally, increases in the purchases of the product. The effectiveness of advertising and promotion efforts can be evaluated by measuring changes in these three areas.

According to various authors, opportunities for successful advertisement are best when the following conditions are met (Engel *et al*, 1979; Chiplin and Sturgess, 1981; Groenewald, 1982; Bagozzi, 1983; Ward *et al*, 1985; Nichols *et al*, 1988; Wills and Cox, 1988; Lee *et al*, 1989):

- A favourable demand with an opportunity to expand the total demand for an existing product.
- Identifiable, significant differentiated products, which have some benefits not readily available from close substitutes.
- Products associated with powerful emotional buying motives, e.g. health or status.
- Products having tangible inherent qualities not readily apparent from inspection.
- When the advertising approach is one of stressing characteristics important to consumers.
- Advertising is backed up by a well co-ordinated market package (e.g. distribution and display).

These observations, and some others, have rather important implications (Greenberg and Suttoni 1973; Krugman, 1977; Engel *et al*, 1979; Orpen, 1981; Groenewald, 1982; Bagozzi, 1983; Craig and Sternthal, 1986):

The advertising impact on sales does not occur fully in current accounting periods, but often continue to impact sales over an extended period of time. This is called the decay or carry-over effect and depends on the product. Sartorius von Bach

Advertising is generally not successful with buyers who are initially unfavourably disposed towards the product in question, or towards those who sell it. Consumers will, moreover, tend to distort messages in advertisements so as to render them more compatible with their own attitudes.

Advertising is seldom really able to change the attitudes and behaviour of purchasers; all it can really do is to reinforce existing attitudes and behaviour, e.g. to persuade consumers to buy more of a product they are already favourably disposed to. If they are not already purchasers of a given product, advertising for that product will have to overcome inertia, which proves to be a stiff hurdle.

The closer the extent to which advertisement appeal matches the predispositions of the consumers, the larger the effect of the advertisement is likely to be. For efficient advertisement, the advertiser should therefore determine what the predispositions of his target consumers are. Thorough market research is a prerequisite for efficient advertising and simultaneously prevents wastage of advertising funds and time.

Advertisers should, since consumers are not an undifferentiated mass of people, divide their targets up into different, more homogeneous groups and use separate advertisements for different groups, based on their observed predispositions. If there is a powerful antagonism against a certain product in one group, advertising aimed at this group is a waste of money and effort.

Given the viewpoints expressed above, in general, there are two major approaches to incorporate advertising variables in demand analyses. In the first approach, advertising is considered as a component of the consumer's direct utility function. After maximising utility subject to a budget constraint, a set of demand functions with advertising as one of the independent variables determines the quantities of commodities consumed. These demand equations can alternatively be obtained by using the duality approach and introducing advertising in the cost function or from an indirect utility function.

The second analytical approach involves household production theory (Verma, 1980). In this approach, utility is a function of a set of basic characteristic non-market goods or commodities under consideration (e.g. convenience, prestige, nutrition and dietary values, etc.). Advertising can be a source of product information, and as such, can be considered as a determinant of The information obtained from advertising knowledge. depends on the level of advertising in the market, the time the consumer allocates to activities where exposure to advertising may occur, the availability of goods important for communication (e.g. magazines, newspapers, television sets, radios, etc.), and education of the consumer. In the household production model, the objective of a rational consumer is to minimise cost, including both the costs of market goods and the time used in the production process. This is subject to the constraints imposed by technology, the given non-market goods considered, the set of capital inputs, the latter assumed to include a stock of knowledge. Thus, the advantage of advertising as an information approach is that it can be introduced as an exogenous factor into the consumer demand function of a particular good, along with other factors such as income, market prices, and other demand determinants. However, research based on this approach has ignored the consumer's time and capital inputs, implying that the consumer does not need to invest time and capital inputs to obtain advertised messages (Lee et al, 1989). To the extent that the household production model depicts behaviour, the impacts of consumer's time and capital inputs must be analysed.

Literature contains considerable discussion concerning the appropriate unit to use in measuring advertising effort. Some researchers prefer to use variables such as advertising awareness, advertising or product recall, and consumer attitude

towards the product, but the information for these variables is usually lacking or difficult and expensive to obtain. As a result, most researchers assume that a consumer's purchase of an advertised product is directly related to whether the consumer recalls a specific advertisement. In turn, the possibility of recalling a specific advertisement is assumed to be directly related to the advertising effort, usually measured by the actual advertising expenditures deflated by a media index (Blaylock and Blisard, 1988). Advertising expenditures have thus often been used as a variable to measure the advertising effort.

Lagged advertising variables are generally included in empirical studies to estimate the decay effect of advertising. Since economic theory does not provide information about the structure and the length of the lag, researchers have experimented with data to obtain certain expected structures for the lag. As suggested above, if the impact of advertising on sales is positively related to the advertising recall, the decay structure for advertising is likely to be a monotonic decreasing function of time. However, certain empirical advertising studies have suggested otherwise (Wills and Cox, 1988). The latter contradiction suggests an area where further research on the decay structure of advertising is needed.

In general, consumer demand theory has not been very helpful in providing information on the lag length or structure for advertising in a demand analysis. Information relevant to the lag effects of advertising can, however, be found in psychology and marketing literature. Craig and Sternthal (1986) have brought together a collection of reprints of classic psychology and marketing articles on remembering, forgetting, advertising wear-out, and frequency effects. However, the theory of demand and of advertising has ignored the effect of the start of the process, through which individual consumers or households cease to purchase a given commodity, which may in itself be a significant analytical component. Not all consumers will purchase a given commodity at all given prices. Some consumers will choose not to purchase any of a given good at certain relative prices. As variables, including prices, income, and advertis-ing expenditure, in the demand function change, some individuals will decide to enter the market while others may decide to exit.

Nichols et al (1988) pointed out that legislative changes intended to co-ordinate and consolidate promotional programs ("nationalising") for dairy, beef and pork were made to facilitate better co-ordination between regions to encourage "equitable" contributions from all producers of these commodities. However, if more local and regional commodity promotional programs get "nationalised", one needs to question other types of "equity" problems, namely whether each commodity group receives "equitable" attention from the promotional institution and whether the "nationalised" programs are consistent with the goals of national agricultural or food programs and policies (Lee et al, 1989). For example, commodity promotion or advertising may not increase total food expenditure, with the result that any increase in the demand for a commodity within the food group through commodity promotion would decrease the demand for other commodities within the same food group. Thus, whether advertising programs should promote the demand for certain commodities at the expense of other commodities is a question that needs to be addressed. This issue is important when food consumption patterns are different from the objectives of other food or nutritional programs.

3. Empirical approaches in measuring advertising impact

Advertising decision criteria was first introduced by normative frameworks deriving an optimal ratio of current advertising expenditure to sales revenue by Dorfman and Steiner (1954) and by Hahn (1959). Their theorem was followed up by Vidale and Wolfe (1957) and by Nerlove and Arrow (1962) who considered advertising as a type of investment to derive optimal advertising policies over time and who developed a sales behaviour

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model. Generally, empirical research on the effects of advertising indicates a positive effect on sales which continues beyond the time of initial advertisement (Clarke, 1976). According to Simon and Arndt (1980) these advertising effects are subject to the law of diminishing marginal returns, which suggests an optimal advertising expenditure.

The "basic model" of the Nerlowe-Arrow theory with time relative to different levels of advertising expenditures, had three parameters: the sales decay constant, saturation level, and the sales response constant. These parameters were later extended to a stock of goodwill (Nerlove and Arrow, 1962), cost of adjustment (Gould, 1970) and an advertising stock (May, 1977). Palda (1964) followed the "basic model" in his analysis and assumed that advertising expenditure accumulates over time by using a Koyck lag structure with geometrically attached declining lags. Jacquemin and Thisse (1972) argued that the Nerlove-Arrow theorem is not a direct counterpart of the Dorfman-Steiner theorem, but a special case where the stock of goodwill is not assumed to be equal to unity (Hochman *et al.*, 1974).

From the equilibrium of supply and demand in a market situation, the effects of changes in advertising on price, quantity of producer' surplus and the concept of elasticities, the following two approaches were used to develop agricultural decision models (Strak, 1983).

Approach A: A group of producers act as monopolist

$$Ae_i = A_{*i} / [(P_i - P_j)Q_i]$$

where

 $A_{*i} =$ the optimal advertising budget for the *i*th product

- $(P_i P_j)Q_i = \text{price differential between the price received in the } i^{\text{th}} \text{ outlet } (P_i) \text{ and price received in the lowest value } alternative (P_i)$
- Ae_{i} = optimal advertising sales premium ratio (ASP ratio)

Approach B: A group of competing producers act as oligopoly

 $Q_d = D(P_i A_i A_i)$ revised demand function $A_{ic} =$ competing firms advertising in the *i*th outlet

$$A_{\mathbf{x}_{i}}/P_{i}Q_{i} = (1/|\mu|)(Ae_{i} + Ae_{ic} \cdot Ae_{ci})$$

where

 $|\mu|$ = absolute value of the own price elasticity of demand

- $Ae_i =$ advertising sales elasticity for the firm's own product sold in the *i*th market
- Ae_{ic} = elasticity of demand for the firm's own product in i^{th} market with respect to changes in competitors' advertising
- Ae_{ci} = elasticity of competitors' advertising with respect to change in the firm's advertising of the *i*th product.

The above advertising decision models are appropriate for many typical agricultural situations, including both generic and brand advertising, but especially for branded products (Strak, 1983:307). The advertising elasticities measure returns to producers and thereby effectiveness of advertising (Chang and Kinnucan, 1990). Thus, when the value associated with a given percentage change in demand is greater than the value of a one percentage change in advertising expenditure, the returns to producers net of advertising cost are positive. However, the concept of elasticities and their reliance on *ceteris paribus* conditions may be disadvantageous due to a continuously changing environment. Thus, a model of advertising decisions should primarily estimate sales response to advertising.

Most analyses of the effect of advertising on consumer demand for agricultural commodities have pragmatically focused on single-equation demand relations using aggregate data. However, a major limitation of the single equation approach is that the substitution and complementary effects resulting from different commodity advertising levels are largely ignored and can not be measured accurately. Another limitation is the need of a priori information about the structure and length of the distributed lag; economic theory on consumer demand does not provide information about the lag length or the lag structure. Seasonal relationships between sales and advertising can be tested by dummy variables (Doran and Quilkey, 1972; Trivedi and Lee, 1981). However, estimations of seasonability of response to advertising imposes implicit restrictions which may influence the estimated pattern (Kinnucan and Forker, 1986). Furthermore, the specification of the functional form for sales (of quantity purchased) and the advertising relationship is very important, because the functional form constraints the shape of the sales/advertising relationship. The functional specifications presented by the linear, double logarithmic, semi-logarithmic, inverse and logarithmic inverse relationships are the most commonly used.

Thus, the sales/advertising relationship has a hump-shaped distribution over time with the total effect of advertising being the cumulative sum of responses over time. Because of strong evidence that the effects of advertising may not dissipate in the current period, researchers have often used flexible distributed-lag structures to model the results (Blaylock and Blisard, 1988). Generally, infinite-lag models do not require a priori specification of the length of the lag and secondly, are flexible in that the data largely determines the shape of the lag structure. However, these types of lag structures are more difficult to estimate than simpler specifications, and the analyst must sometimes restrict the parameters of the infinite-lag structure to obtain meaningful results. Regardless of the distributed lag model selected, the length of the lag has to be empirically determined. In comparing various surveys of econometric sales/advertising analyses, Clarke (1976) found that the advertising effect on sales lasts for months rather than years. Bultez and Naert (1979) found that different lag structures lead to similar practical implications on decision making and statistical evidence.

4. Effects of advertising on some agricultural products

Through a variety of institutional structures agricultural producers have developed programmes to generate revenue and to operate extensive promotion programs. Some operate at a national level, others at a regional or subregional level. Some are based on components of marketing orders and others on special purpose legislation (Nichols *et al*, 1988). Generic advertising as a marketing tool grew within established industries (dairy, beef, etc.) and interests in generic advertising increased among smaller and emerging industries. However, relative little is known about the effects of generic advertising on consumers' perception or purchase behaviour, especially with respect to the emerging industries.

Only a few examples of advertising research done elsewhere are given. The main fields of research done in advertising agricultural products are in the promotion of beef, milk, cheese, butter, cream, fats and oils, fruit, potatoes and fish. Since research done in these fields is limited, these results only give some indication for future implications in the South African marketing system.

In analysing welfare and market effects by beef promotion on livestock producers, Jensen *et al* (1989) illustrated that the short and long term effects of generic beef advertising depend on decay rates and the sustainability of the campaign. Beef consumption fell in the short run due to reductions in supply and a "build-up" of the breeding herd, while in the long run beef supplies increased as producers responded to the advertisement implied profit incentives. Beef promotion affected pork and

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poultry prices indirectly. The responses of pork and poultry producers increased the short term price of beef, which lead to larger supplies and resulted in a period of lower producer prices for all livestock producers. The initial impact of generic advertising decreased the market share. However, as the supplies increased, the market share and value increased and was maintained at a new and higher level (Jensen *et al.*, 1989). Thus, with respect to beef, generic advertising may be more advantageous in times of large supply than in periods of build-up.

With respect to milk, results obtained by Strak (1983) indicate that advertising had a significant positive effect on sales after a lag of three months and that prices and income were statistically significant explanatory variables. However, in times of decreasing milk consumption, the current lagged levels of advertising showed no statistical significant effect on sales (Hessner and Mellor, 1986). However, results suggested some statistical evidence which links advertising and sales if explanatory variables like consumer tastes were included to the analysis.

In analysing the regional effect of advertising on milk sales, Thompson and Eiler (1975) found a positive supply response resulting from the advertising program. This supply response tended to decrease the net returns to advertising. Kinnucan and Forker (1986) determined that appropriate timing of milk advertising expenditures can increase the effectiveness of the investment. Liu and Forker (1988) found that the fluid milk advertising program resulted in higher consumption, with an elasticity of 0.0028. The two month advertising/sales lag suggests that fluid milk demand converges to a new equilibrium six month after advertisement expenditures, which illustrates the complexity of agricultural advertising. Results also showed that the advertising program was cost effective. Results by Thompson and Eiler (1977) showed that regional generic fluid milk advertising is efficient only with high price differences and low price elasticities of supply and that the economic effectiveness of advertising was minor even with a high price elasticity of supply of 0.8.

The first national approach in analysing the dairy industry in the US was that of Ward and Dixon (1989) who followed up analyses of Thompson and Eiler (1977), Kinnucan and Forker (1986) and Liu and Forker (1988). They obtained statistical evidence that the national dairy promotional program resulted in increased milk consumption and strengthened the overall effectiveness of dairy advertising. The income and price elasticities of respectively 0.2934 and -0.1534 (Ward and Dixon, 1989) were within a reasonable range of prior studies (Liu and Forker, 1988; Ward and McDonald, 1986). Demographic variables, of both regional and long term changes were highly significant, while the weak complementary orange juice consumption coefficients were not significant at a 5 per cent level. Other studies indicated no or low cross price significance between cola and coffee on the one hand, and liquid milk on the other (Ward and Dixon 1989).

In a study conducted by Blaylock and Blisard (1988), the effects of advertising on the demand for natural and processed cheese in the United States, generic advertising of cheese appeared not to influence normal cheese purchases of households, but it did influence the demand of households normally not purchasing cheese. The opposite was true for processed cheese. Results of estimating the effect of increasing real generic advertising expenditures indicated that an increase in advertisements of cheese would have virtually no effect on the natural cheese consumption, but would increase the processed cheese consumption.

In a detailed study of the UK butter market, no significant relationship between the level of advertising and the level of sales was found (Hessner and Mellor, 1983). However, by using a second degree Almon polynomial Strak (1983) determined that cream sales in UK respond to advertising. A generic cream advertising elasticity of 0.029 was calculated, while the price and income elasticity of liquid milk was -0.81

and 0.72 respectively. A market share model for English butter representing brand advertising and English butter as a share of total butter advertised in the UK was also constructed. The brand advertising elasticity was calculated at 0.34 and competitors' advertising at -0.22. The price elasticities of the English, Danish and New Zealand butter were -7.13, 4.33 and 4.09 respectively (Strak, 1983). Chang and Kinnucan (1990) determined the optimal advertising level for butter sales in Canada. Results indicated that butter advertising was profitable at the current expenditure level, assuming a perfectly elastic supply curve, a logarithmic or inverse response function and the prior determined advertising elasticity for butter of 0.023.

Goddard and Amuah (1989) established intercommodity effects of advertising in the Canadian fats and oils market. No significant response to advertising occurred in the aggregate equation, which indicates substitution as a result of advertising in the fats and oils market. Similar results have been reported by Pitts and Herlihy (1982). The demand for individual fats and oils was found to be significantly affected by lagged advertising expenditure levels, habit persistence, trends, prices and expenditures. The mean margarine demand was less price elastic (-0.60) than butter (-0.72). All mean own advertising elasticities were positive, varying between 0.01 to 0.07 with advertising of vegetable oils by far the most effective. Regarding cross advertising effects, margarine and butter advertising had a negative effect on all other fats and oils, with butter advertising showing the leading effect. Vegetable oil advertising showed a small positive effect on butter demand, but had negative effects on the demand for margarine.

With respect to fruit, Hochman et al (1974) combined optimal control models (Gould, 1970) and econometric estimates of sales response functions to derive advertising policies for the Florida citrus industry. The normative optimal control solution corresponds to the Dorfman-Steiner (1954:826) theory, which states that the maximising profit firm should equate its marginal sales response to advertising with the price elasticity of demand. However, this theory fails to take into account that future benefits results from a unit increase of advertising at the time. The retail demand estimated for citrus indicated unitary price elasticity. Gains (actual and net present value) from optimal policy included both annual re-allocations of advertising expenditures and redistributions of advertising funds from the winter quarters to summer quarters. Ward (1975) found a statistically significant sales response to advertising in processed grapefruit. For the grapefruit industry, the gains from advertising-pricing co-ordination must be evaluated against the social and political cost from larger taxes and increased controls (improving the quality of advertising in order to influence the demand more effectively). According to the principle of spontaneous fruit purchase behaviour, generic advertising is more advantageous than brand advertising.

A study on the effectiveness of generic advertising on fresh potatoes showed a statistically insignificant effect on fresh potato consumption, while other demand factors (income, growth of female labour force, and away from home food consumption) showed negative and statistically significant impacts on consumption. However, these negative response of fresh produce consumption to generic advertising may not suggest misallocations of expenditures due to a related image of potatoes as fattening with little important dietary nutrients (Jones and Ward, 1989). Brand advertising showed a statistical significant impact on the demand for chips with the current effect greater than the lagged effect. Both generic and brand advertising have positive and statistically significant impacts on the consumption of frozen and dehydrated potatoes. Other factors (income, growth in female labour force, fast food establishments, and away from home food consumption) for frozen potatoes also showed statistically positive impacts on consumption, while statistically significant impacts for income, retail price of chocolate cookies (both positive) and chips' retail price (negative), and income for chips consumption were obtained. Positive (retail price for fresh and frozen potatoes) and negative factors (retail price of dehydrated potatoes and growth of

female labour force) showed statistically significant impacts on dehydrated potato consumption. Most non-fresh potatoes were purchased in non-retail markets or institutional establishments where advertising was less effective (Jones and Ward, 1989). Furthermore, area/origin US potatoes appear to be more popular than just potatoes. This give rise to the question: Does generic area-origin advertising have more of an effect?

5. Implications for South African agriculture

Although South Africa is a part of Africa, it has a highly developed and sophisticated marketing structure which necessitates the analysis and decomposition of foreign advertising research done in Europe and America, for possible application in South Africa due to the virtual non-existence of research on generic or brand advertising of agricultural products in South Africa. Some results obtained in foreign countries can be used to develop and determine the effectiveness of advertising models for South Africa. This evidence could be useful in answering some questions, since any increase in the demand for a commodity, within a food group, through commodity promotion would, decrease the demand for other commodities within the same food group. Thus, whether advertising programs should promote the demand for certain commodities at the expense of other commodities needs to be addressed.

Research suggests that advertising campaigns have an influence on purchase behaviour, both via signalling and reminder effects and indirectly by improving attitudes toward commodities. Advertising effects take time to appear ("build-up"). For example, both the carry-over and the decay (50 % for both milk and beef, Jensen *et al.*, 1989:6) effects of advertising exist. Generally, empirical research on the effects of advertising indicates a positive effect on sales that continues beyond the time of initial advertising. However, controversies exist, for example with respect to generic fluid milk advertising which was efficient only with high price differences and low price elasticities of supply. The positive sales impact does not necessarily imply that it pays to promote the product. The benefits of advertising have to be carefully compared against the costs. If the promotion programme generates positive returns, producers will eventually increase supplies. Thus, short-run gains may be eroded by long-term increases in supply of the commodity. However, advertising effects are generally small. Hence, in evaluating whether advertising pays, it is important to consider both the short-run sales impact and the longer-term supply response.

Studies with respect to commodity advertising programmes and their benefits to farmers generally gave conflicting results. Opponents of generic advertising pointed out that the increase of a firm's advertising generally benefits the producer through some combination of higher prices and output but that there may be little or no long term increase in price or in producer profits. Furthermore, it has been pointed out that as more industries do promotion, there is some tendency toward mutual cancellation, e.g. maize promotion cancels out wheat promotion and vice versa; sometimes these products are even produced on the same land.

The successful and judicious use of advertisements can, however, in some cases increase sales of related products which are either complements in consumption or intermediate inputs for the advertised products. Also, if it is accepted that a product such as beef is one in which advertising can be successful (high income elasticity of demand; differentiated product with powerful emotional buying motives, etc.), then the question becomes whether, rather than trying to promote maize products, maize groups should not, in an advertising sense, join forces with beef interests. Advertisements such as "Yellow maize fed beef is better" could conceivably benefit both and would probably benefit maize sales more than advertisements aimed at increasing human consumption of maize (Groenewald, 1982).

Policy makers can use generic advertising to co-ordinate demand with production in order to stabilise producers' income. Commodity advertising programs do not necessarily have to be big to be effective. Targets must be relatively to be big to be effective. homogeneous and funds must be carefully allocated to ensure that marketing resources are being used in the most efficient manner possible. Due to the dynamics of markets, ongoing market research is an essential element of effective promotion programme management. Due to production cycles and im-pacts of external factors, appropriate timing of promotion campaigns can increase the effectiveness of the investment, which in turn should not be based on short term objectives alone. However, due to the increasing political pressures and government intervention, results and elasticities should be used with care. Evaluation should be regarded as an integral part of any commodity promotion scheme and could be useful for diagnosing market changes, making program allocations, implementation decisions and adapting advertising campaigns.

6. Conclusions

Two major approaches to incorporate advertising variables are used in demand analyses. In one, advertising is considered as consumer's utility and in the other, household production theory is used to evaluate promotion practices for the changing marketing environment. Considerable discussion exists in the literature concerning the appropriate unit to use when measuring the advertising effort. Most analyses considering the effect of advertising on consumer demand for agricultural commodities have pragmatically focused on single-equation demand relations using aggregate data. However, limitations exist and lagged advertising variables are included to estimate the decay effect of advertising. Empirical research on the effects of advertising generally indicates a positive effect on sales, and this effect continues beyond the time of initial advertising. However, controversies exist. A positive sales impact does not necessarily imply that it pays to promote a product. The benefits of advertising have to be carefully compared against the costs. If the promotion programme generates positive returns, producers will eventually increase supplies. Thus, short-run gains may be eroded by long-term increases in supply of the commodity. Hence, in evaluating whether advertising pays, it is important to consider both the short-run sales impact and the longer-term supply response. Research done elsewhere pointed out that generic advertising on beef may be more advantageous in times of large supply than in periods of build-up. It was found that regional generic fluid milk advertising is efficient only with high price differences and low price elasticities of supply. No clear conclusion could be made with respect to cheese, butter, fats and oils. However, it seems that brand advertising is more advantageous than generic advertising as is the case with potatoes and their products, while the opposite is true for fruit advertising. Due to the dynamics of markets, advertising research is essential and of urgent need in effective promotion programme management for South African agricultural commodity markets.

References

ALBION, MS and FARRIS, P. (1981). The Advertising Controversy: Evidence on the Economic Effects of Advertising. Auburn House, Boston.

BAGOZZI, RP. (1983). "A Holistic Model for Modelling Consumer Response to Innovation". Operations Research, Vol 31, No 2:128-176.

BLAYLOCK, JR and BLISARD, WN. (1988). "Effects of Advertising on the Demand for Cheese". Economic Research Service. Technical Bulletin No 1752, USDA, Washington. D.C.

BULTEZ, AV and NAERT, PA. (1979). "Does Lag Structure Really Matter in Optimizing Advertising Expenditures". Management Science, Vol 25, No 4:454-465. CHANG, H-S and KINNUCAN, H. (1990). "Generic Advertising of Butter in Canada: Optimal Advertising Levels and Returns to Producers". Agribusiness, Vol 6, No 4:345-354.

CHIPLIN, B and STURGESS, B. (1981). Economics of Advertising. (2nd ed.) Rinehart and Winston Ltd, Holt.

CLARKE, DG. (1976). "Econometric Measurement of the Duration of Advertising Effects on Sales". Journal of Marketing Research, Vol 13, No 4:345-357.

COWLING, K, CABLE, J, KELLY, MP and McGUINESS, AJ. (1975). Advertising and Economic Behaviour. MacMillan Press, New York.

CRAIG, CS and STERNTHAL, B. (Eds.) (1986). Repetition Effects Over the Years: An Anthology of Classic Articles. Garland Publishing Inc., New York.

DORAN, HE and QUILKEY, JJ. (1972). "Harmonic Analysis of Seasonal Data: Some Important Properties". American Journal of Agricultural Economics, Vol 54, No 2:646-651.

DORFMAN, R and STEINER, PO. (1954). "Optimal Advertising and Optimal Quality". American Economic Review, Vol 44, No 4:826-836.

ENGEL, JF, WARSCHAW, MR and KINNEAR, TC. (1979). Promotion Strategy. (4 ed.), Richard D. Irwin, Illinois.

GODDARD, EW and AMUAH, AK. (1989). "The Demand for Canadian Fats and Oils: A Case Study of Advertising Effectiveness". American Journal of Agricultural Economics, Vol 71, No 3:741-749.

GOULD, JP. (1970). "Diffusion Processes and Optimal Advertising Policy", in Microeconomic Foundations of Employment and Inflation Theory, eds. Edmond S. Phelps *et al.*, New York, WW Norton and Co.

GREENBERG, A and SUTTONI, C. (1973). "Television Commercial Wearout". Journal of Marketing Research, Vol 12, No 1:47-54.

GROENEWALD, JA. (1982). "Advertising Agricultural Products: Yes or no?". Agrekon, Vol 21, No 1:1-4.

HAHN, FH. (1959). "The Theory of Selling Costs". Economic Journal, Vol 69, No 2:293-312.

HESSNER, C and MELLOR, CJ. (1986). "An Empirical Analysis of the Relationship between Advertising and Sales: A Case Study of the Liquid Milk Market". Journal of Agricultural Economics, Vol 37, No 1-3:193-206.

HOCHMAN, E, REGEV, U and WARD, RW. (1974). "Optimal Advertising Signals in the Florida Citrus Industry: A Research Application". American Journal of Agricultural Economics, Vol 56, No 4:697-705.

JACQUEMIN, AP and THISSE, J. (1972). "Strategy of the Firm and Market Structure: An Application of Optimal Control Theory". In: Market Structure and Corporate Behaviour, M. Cowling (editor), London, Gray-Mills.

JENSEN, HH, JOHNSON, SR, SKOLD, K and GRUNDMEIER, E. (1989). "Impacts of Promotion on the Livestock Sector: Simulations of Supply Response and Effects on Producer Returns". Paper presented at the NEC-63 Research Conference on Commodity Advertising and Promotion. 22-23 February 1989, Orlando, Florida.

JONES, E and WARD, RW. (1989). "Effectiveness of Generic and Brand Advertising on Fresh and Processed Potato Products". Agribusiness, Vol 5, No 5:523-536.

KIHLSTROM, RE and RIORDAN, MH. (1984). "Advertising as a Signal". Journal of Political Economy, Vol 92, No 3:427-450.

KINNUCAN, HW and FORKER, OD. (1986). "Seasonally in the Consumer Response to Milk Advertising with Implications for Milk Promotion Policy". American Journal of Agricultural Economics, Vol 68, No 1:562-571.

KRUGMAN, HR. (1977). "Memory without Recall, Exposure without Perception". Journal of Advertising Research, Vol 17, No 1:7-12.

LANCASTER, K. (1966). "A New Approach to Consumer Theory". Journal of Political Economics, Vol 74, No 2:132-157.

LEE, J-Y, BROWN, MG and FAIRCHILD, GF. (1989). "Some Observations on the Impact of Advertising on Demand". Agribusiness: An Institutional Journal, Vol 5, No 6:607-618.

LIU, DJ and FORKER, OD. (1988). "Generic Fluid Milk Advertising, Demand Expansion, and Supply Response: The Case of New York City". American Journal of Agricultural Economics, Vol 70, No 2:229-236.

MAY, ME. (1977). "Generic Advertising". Oxford Agrarian Studies, Vol 6:135-166.

MORRISON, RM. (1984). "Generic Advertising of Farm Products". Agricultural Information Bulletin Number 481, Economic Research Service, USDA, Washington, DC.

NERLOVE, M and ARROW, KJ. (1962). "Optimal Advertising Policy Under Dynamic Conditions". Economica, Vol 29, No 114:129-142.

NICHOLS, JP, MYERS, LH and FRANK, G. (1988). "Generic Agricultural Commodity Advertising and Promotion: Its Role in Marketing". In: Generic Agricultural Commodity Advertising and Promotion. WJ Ambruster and RO Wills (eds.). Cornell University, Ithaca, New York.

ORPEN, C. (1981). "How advertising works". Research for Marketing, Vol 8, No 1:1-17.

PALDA, KS. (1964). The Measurement of Cumulative Advertising Effects. Englewood Cliffs, N.J. : Prentice-Hall, London.

PITTS, E and HERLIHY, P. (1982). "Perverse Substitution Relationships in Demand Studies: The Example of Butter and Margarine". Journal of Agricultural Economics, Vol 33, No 1:37-46.

SCHMALENSEE, R. (1978). "A Model of Advertising and Product Quality". Journal Political Economics, Vol 86:485-503.

SIMON, JL and ARNDT, J. (1980). "The Shape of the Advertising Response Function". Journal of Advertising Research, Vol 4, No 1:11-28.

STRAK, J. (1983). "Optimal Advertising Decisions for Farmers and Food Processors". Journal of Agricultural Economics, Vol 34 < No 3:303-315.

THOMPSON, SR and EILER, DA. (1975). "Producer Returns from Increased Milk Advertising". American Journal of Agricultural Economics, Vol 57, No 3:505-508.

THOMPSON, SR and EILER, DA. (1977). "Determinants of Milk Advertising Effectiveness". American Journal of Agricultural Economics, Vol 59, No 1:330-343.

TRIVEDI, PK and LEE, BMS. (1981). " Seasonal Variability in a Distributed Lag Model". Review Economic Studies, Vol 48, No 2:497-505.

VERMA, VK. (1980). "A Price Theoretic Approach to the Specification and Estimation of the Sales-Advertising Function". Journal of Business, Vol 53, No 3:115-137.

VIDALE, ML and WOLFE, HB. (1957). "An Operations-Research Study of Sales Response to Advertising". Operations Research, Vol 5, No 3:570-581.

WARD, RW. (1975). "Revisiting the Dorfman-Steiner Static Advertising Theorem: An Application to the Processed Grapefruit Industry". American Journal of Agricultural Economics, Vol 57, No 1:500-504.

WARD, RW, CHANG, J and THOMPSON, S. (1985). "Commodity Advertising: Theoretical Issues Relating to Generic and Brand Promotions". Agribusiness, Vol 1, No 2:269-276.

WARD, RW and DIXON, BL. (1989). "Effectiveness of Fluid Milk Advertising since the Dairy and Tobacco Adjustment Act of 1983". American Journal of Agricultural Economics, Vol 71, No 3:730-740.

WARD, RW and McDONALD, WF. (1986). "Effectiveness of Generic Milk Advertising: A Ten Region Study". Agribusiness, Vol 2, No 1:77-79.

WILLS, RL and COX, TL. (1988). "Generic Agricultural Commodity Advertising and Promotion: Economics and Impacts" In: Generic Agricultural Commodity Advertising and Promotion. WJ Ambruster and RL Wills, (eds.). Cornell University, Ithacha, New York.