

NEW EMERGING COMPETITORS - WHAT CAN WE LEARN FROM THEM?

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ABSTRACT

This article discusses the competition that arises from new industry alignments that provide greater production efficiency, economies of scale, and traceability. It is anticipated that industry consolidation will continue and that a vertically coordinated system is required for long-run competitiveness in the pork business. To date mainstream pork production has been commodity oriented but it would seem consumers are becoming more demanding in terms of quality, value, and traceability. Thus, there is a need for new business models between producers, processors and retailers.

INTRODUCTION

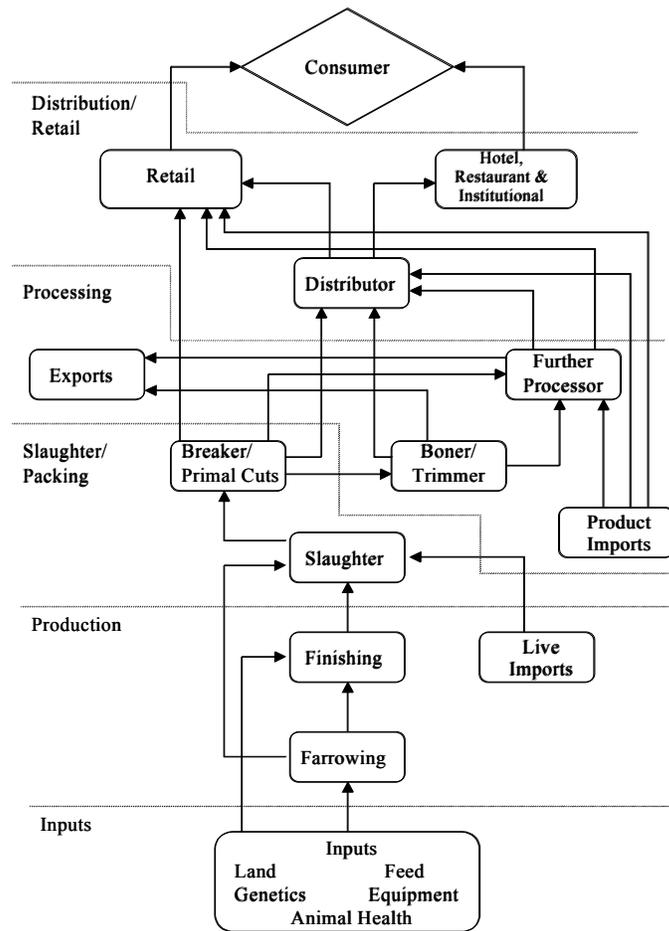
The competition focused on within this paper is not simply new regions of the world producing low cost pork for the export market, but rather the competition that arises from new industry alignments that provide greater production efficiency, economies of scale, and traceability. Figure 1 displays the typical portrait of hog production and the marketing supply chain. There are five main shareholders in the pork supply chain and they are: producer; slaughter/packer; processing; distributor/retailer; and consumer. Until recently, these supply chain participants acted independently of each other with little information flow from one level to the next. However, there is increasing evidence that given the complexity of the industry, the degree of specialization involved, and the amount of capital required that perhaps a more vertically coordinated approach is needed if Ontario wants to avoid the risk of becoming uncompetitive.

It is important to recognize that most non-agricultural sectors are in a post-industrial revolution and that in this setting, power comes from information, knowledge, and concepts. The swine industry however, has not reached this stage and is still going through the industrial revolution. In the U.S., it is estimated that over 70% of the swine industry has adopted some form of industrialization. As with any change there are early and late adopters and it is speculated that many of the remaining 20% to 30% of the U.S. producers will struggle to have long term viability within the hog industry.

Along with this industrial process comes the irrefutable and seemingly irreversible trend of supply chain consolidation. It is now very common in the U.S. to have CR4 ratio's (i.e. the four-firm concentration ratio) exceeding 80% for many agricultural sectors (cattle 1997 - 80%). In terms of time line, it has not been until the last 8 to 10 years that industrial techniques have been applied to the hog industry. Prior to the last few years, the technology

and production systems needed to gain control over diseases when large volumes of pigs were mixed together had not yet been developed. Large-scale three-site production did not move into Ontario until 1994.

Figure 1. Hog Production and Marketing Supply Chain.



Source: “Potential Impacts of the Proposed Ban on Packer Ownership and Feeding Livestock”, Sparks Companies Inc., 2002.

Typical industrialized techniques for the swine industry include: three site production (i.e. sow, nursery, and finishing all at different locations); the ability to construct large sow units (i.e. 2,400 head); building finishing barns in multiples of 1,000; the use of a common genetics program for the entire sow herd; high frequency of artificial insemination; and the use of a centralized feed manufacturing system that delivers prepared feeds to barns in a 80 to 100 km radius. Currently in the U.S., there is a lot of experimentation in terms of industry organization. Examples of industry alignment include: vertical integration (e.g. Smithfield Foods - 700,000 sows of which 55% are NPD genetics); vertical coordination (e.g. various marketing contracts); alliances (e.g. Pipestone pork producers); and co-ops (e.g. the Illinois producer group i.e. American Premium Foods Inc.). All of these arrangements have as their

end goal the desire to produce the correct type of pork demanded by the consumer, hence, lowering the overall operational risk of the production system.

If the poultry industry is used to speculate about future swine industry models, then a highly coordinated system is likely where there are no breaks in the information flow between various components (i.e. input suppliers, producers, processors and retailers). Producers in this setting have become managers of contracts. It is anticipated that as the hog industry moves into production to specifications, producers will be faced with lower per unit margins and the variability in profitability will remain large which will maintain the unusually high income to risk relationship. To date there has been little sharing of information between retailers, processors, and producers. Frequently, in many systems there is a break in the information flow and if a niche has been discovered, private business has kept the information to allow for profit maximization.

In several regions of North America (including Ontario), any restriction on the ability to decide on what genetics to use, what company to purchase feed from, what health status to maintain, and what housing system to use, would be viewed as a threat to independent pork production. However, the bundling of farm inputs to provide possibly better traceability, better quality assurance, and to allow for branding can result in increased sales volumes if properly communicated with the consumer (e.g. Danish pork). Branding is normally defined as a guarantee that pork was produced in a certain way (i.e. consistency every time). To date in Canada, while there has been much talk about meat traceability and the development of “story” pork, the majority of consumers have not demanded this level of information about the meat they consume. Still, using Smithfield Foods as an example, branded fresh pork now accounts for 40% of their fresh pork sales and continues to grow at double digit rates. The branding occurring in the U.S. is not simply what feed is used, rather it involves animal welfare, health status, genetics, food safety and value added case-ready packaging. It is now known that in the U.S., 53% of every food dollar is spent away from home and that 10% of all food consumed is eaten in a vehicle.

Given this discussion, it would appear likely that pork production in the future will be done under tight protocols and that producers, packers, and processors will band together to gain economies of scale for: accessing inputs; knowledge; and to match the scale of the forward player. The development of these food chains will have diversity i.e. producing 2 or 3 different meat products, and have the capacity to be global traders.

LITERATURE REVIEW

The summary provided below gives the reader an understanding of why the pork supply chain is consolidating and illuminates some of the challenges faced by industry stakeholders.

Competition Theory

Competition theory has several implications for a discussion on structural alignment in the meat industry. First, although industry structure (i.e. number of firms and size of firms, and

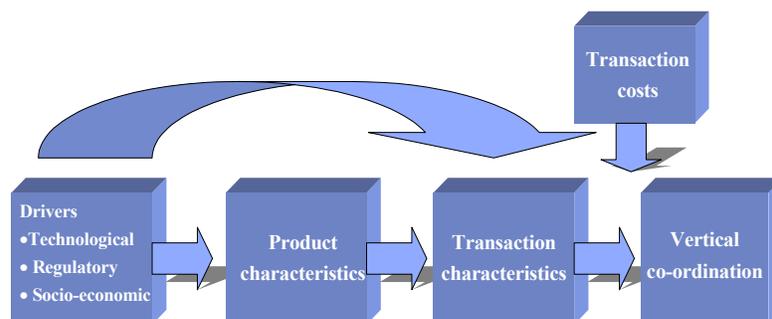
vertical alignment) is firmly established in the minds of many producers, legislators and even consumers as a critical indicator of whether an industry is competitive, this link is not warranted. The often implicit standard of perfect competition that lies behind the link between structure and efficiency does not constitute an operational criterion to assess performance, simply because it presumes to know more than can be known in the absence of competition. Secondly, it cannot provide us with an objective and independent efficiency standard. Even the definition of the boundaries of a market or of an industry is problematic. And this definition is necessary before market share calculations can be made in the first place.

A more helpful understanding of competition as a process rather than an outcome shifts our attention to search for artificial barriers to entry. Increasingly, competition is more about innovation, product differentiation, price-cutting, advertising, the development of personal relationships with buyers or sellers, and reputation or good will. This reorientation would prompt us to examine things like the rate at which new products are introduced or at which new uses are being found for existing products. In a trial and error competitive process, it would be expected that some products do not make the grade. Are there any discernable patterns in product pricing when the entire life cycle of a product is considered? The inelastic demand for pork (i.e. a relatively large change in price results in a relatively small change in quantity demanded), means that competition in the pork market may tend to be expressed more strongly in ways other than price.

Conceptual Framework For Vertical Coordination

Below in Figure 2 is a model which helps to illuminate our understanding of why the pork supply chain is vertically aligning itself. The key drivers to vertical coordination can be categorized into: technological; regulatory and socio-economic. Technological drivers are those that affect economies of scale and can impact on product characteristics. Technology creates economies of scale from large-scale production/processing units, or allows tighter control over product quality through feeding, housing, or management practices. These economies may encourage closer vertical coordination and industry consolidation if it is less costly for a processor to do these management functions internally rather than deal with larger numbers of small producers.

Figure 2. Vertical Coordination Model.



Source: “Vertical Linkages in Agri-Food Supply Chains in Canada and the United States”, Agriculture and Agri-Food Canada.

Technology can also impact on product perishability and the introduction of new product characteristics e.g. lower pH pork.

Regulatory drivers of interest to the swine industry are liability, traceability and product standards and grades. For example, the 1990 Food Safety Act in the UK increased the legal liability of food firms, causing them to seek more information about upstream production practices in the food supply chain. In 1998, the EU endorsed plans to extend product liability laws to farmers, whereas previously agricultural producers had been exempt. The requirement for full traceability of agricultural products in the event of a breakdown in food safety may be a regulatory requirement in itself. In general, it is speculated that with the demand for increased traceability, occasional supply chain relationships will move towards closer vertical relations.

Socio-economic factors can also lead to greater vertical coordination. Changes in consumer life-styles and preferences have increased the demand for branded, further processed meals, including home meal replacements. Product quality is extremely important and is signaled by a firm's brand name. To differentiate their products, to protect the investment in their brand name, and to reduce the monitoring costs of guaranteeing the quality of their inputs, processors will prefer closer vertical relations with their suppliers. Heterogeneous consumer preferences in international markets encourage product differentiation, moving the sector away from its traditional commodity orientation and encouraging closer vertical coordination.

Product characteristics affect the transaction characteristics and thereby influence the vertical relationships that evolve. Five product characteristics that lead to greater vertical alignment are: product perishability, the amount of product differentiation, the variability and visibility of quality difference, and new characteristics of interest to consumers e.g. organic. Product perishability creates uncertainty, adds to the complexity of the transaction, and increases the negotiation cost, thus it is more likely to lead to a greater degree of vertical coordination. Similar comments can be made regarding product variability and new characteristics to consumers.

The model then looks at transaction characteristics, which can be broken down into uncertainty, frequency, asset specificity, and complexity. The uncertainty occurs over product quality, reliability of supply, price, and just the difficulty in finding a buyer, particularly if the product has unique characteristics. Asset specificity arises when one party has made an investment in a production process specific to one buyer or seller, thereby locking themselves into that relationship for a period of time. Transactions involving specific assets leave firms vulnerable to opportunistic behaviour and lend themselves to contracting or vertical integration as the choice of governance structure due to the high monitoring and enforcement costs.

Complexity mitigates against spot market transactions. Higher transaction costs are incurred in writing fully contingent contracts in situations of complexity. If the transaction costs become sufficiently high, vertical integration may occur. A strategic alliance which allows sufficient flexibility in the relationship to deal with the complexities is another possibility. In the presence of asset specificity at a high level, this results in vertical integration because of

the monitoring and enforcement costs that arise in bilateral contractual arrangements or strategic alliances.

In summary, this model provides a framework to discuss and explain why vertical alignment is occurring in the swine industry. The demand for greater traceability, the incorporation of new technology such as 3 site production coupled with a perishable product plus the need for precise product specifications i.e. pork with a certain pH or colour, all leads to a more vertically coordinated supply chain. Increasingly, packer/producer and packer/retailer transaction costs are increasing because of the need for traceability and more defined meat characteristics. In addition, the capital investment and asset fixity in pig production, processing and retailing is high which leads to more vertical coordination.

RETAIL CHANGES

Similar to the producer and processor levels, retail consolidation has been occurring as well. The top 3 retailers in Canada are estimated to have market share of 60 to 70% whereas in the U.S. the top 5 have only 42%. While independent retailers and smaller chains are fast losing ground in the rapidly consolidating food retail market, in 1998 they still accounted for about \$US70 billion in sales with 16% of the food retail market. However, it must be recognized that food industry consolidation will continue in the U.S. primarily driven by Wal-Mart with its aggressive food retailing strategy of everyday-low-pricing and Supercenter concepts which will apply grow-or-perish pressure on other retailers. Smaller market retailers will continue to face fierce pricing competition.

Growing pressure from consolidating retail operations reduces margins for meat packers, processors, and others. Processors and handlers report growing competition for markets, and the recent retail consolidations have meant narrower margins in both fresh and processed products as processors compete to meet increasingly stringent retail requirements and narrowed margins. Also, large retail chains will often only consider potential suppliers that are capable of producing the large volume of product necessary for national or regional distribution. These trends, in turn, increase pressure on processors to increase their volume while at the same time reducing their costs. The pressures to reduce costs force the search for low-cost livestock supplies. Processors expect that these trends will continue and point to recent trends as evidence.

Trends toward consolidation at the consumer level have been persistent and far-reaching. In just the past few years:

- Kroger acquires Fred Meyers, forms largest retailer (1999)
- Royal Ahold acquires east coast firm, Giant Foods/Pathmark
- Wal-Mart, together with Sam's Club expands very rapidly, becoming largest retailer by 2000. Wal-Mart's food sales for 2000 are nearly three-fold the 1996 level, and Safeway acquires Dominick's.

Consolidation at retail probably is about half done, say trade analysts. The expectation is that the top five retailers will soon account for more than 50% of food sales and that consolidation will continue rapidly in the future. For a listing of the major U.S. Supermarkets and their sales volumes, see Table 1.

Table 1. Supermarket Sales and Rankings, 2000.

1999 Rank	2000 Rank	Company	Stores number	Sales bil \$	Share %
7 ¹	1	Wal-Mart Supercenters	862	57.2	11.1
1	2	Kroger Company	2,359	49.0	9.5
2	3	Albertsons's	2,514	36.4	7.1
3	4	Safeway	1,726	32.0	6.2
4	5	Ahold, USA	1,208	27.8	5.4
		Top Five	8,669	202.0	39.3
13	6	Supervalu	457	23.3	4.5
8	7	Publix Super Markets	645	14.6	2.8
17	8	Fleming	164	14.4	2.8
6	9	Winn-Dixie Stores	1,160	13.8	2.7
	10	Loblaws Cos.	596	13.8	2.7
		Top Ten	11,691	282.0	54.8

¹ Ranked number 4 when Sam's Club stores are included

Source: Supermarket News

Livestock quality is essential to support trends toward more branded products. Also important is the growing emphasis on new product development including items that are more convenient for consumers to use. Enhanced control over quality is essential as packers compete for financing necessary to bring new, more convenient products to markets to satisfy ever more insistent consumer demands.

Consumers now have the ability to purchase more and higher valued meat products. The largest single market for pork today is pork for further processing, representing 37.5% of 1999 sales. These products include branded lunchmeats, further processed products under the processor or retail label, or further processed products going into food service or export markets. Branded programs by packers, a rapidly growing market segment, make up 18.2% of the current market volume and in the future will represent an even larger share of pork sold. These pork products must carry a higher degree of branded reputation and liability and demand higher standards to consistently satisfy end-user expectations. Within the branded products there is expected to be a switch from further processing by other companies to one of branded retail and food service pork items by packers. While most pork is unbranded, except for processed products like sausage, ham, and bacon, some new products, like Smithfield Foods Lean Generation brand of lean, fresh pork products provide brand name quality assurances and consistency for consumers. Table 2 shows packer pork sales by retail category.

Table 2. Packer Pork Sales by Category, 1999.

Category	%
Retail grocery, non-branded	14.2
Branded, value-added products	14.2
Food service non-branded	7.8
Food service branded value added	2.3
Domestic processor for further processing	37.5
Export non-branded commodity sales	6.3
Export branded value added sales	1.7
Wholesaler or broker	11.7
Other	4.5

Source: Meat Packer Vertical Integration and Contract Linkages in the Beef and Pork Industries: An Economic Perspective, American Meat Institute, May 2000, pg. 76.

THE DANISH PORK SYSTEM

Denmark seems to have no natural advantages in hog and pork production over other countries. By all conventional input measures, Denmark appears to have a significant cost disadvantage when compared to major competitors: land is scarce and high priced, manure disposal regulations are strict, wage rates in farming and processing are well above those of other major pork producing countries, feed costs are high as a result of EU Common Agricultural Policy, line speeds in processing plants are slow and the growing markets in East Asia are distant. The continued success of the Danish hog and pork industry appears to be related to its structure, achieving strategic linkages along the marketing chain through the cooperative approach.

The striking characteristic of the Danish hog and pork industry is its cooperative structure. In the year of 2000, about 93% of total throughput in the industry was channeled through just 3 large meat processing cooperatives. The most significant industry-wide actor in the Danish pork sector is The Federation of Danish Pig Producers and Slaughterhouses i.e. Danske Slagterier (DS). It is an umbrella organization encompassing all of the Danish pork cooperatives. DS fulfils a number of roles, including representing the pork industry in consultations and negotiations with outside bodies, formulating industry-wide strategies, developing new products and services for its producers and encouraging close cooperation among all stages of the pig production and marketing chain.

DS plays a pivotal role in coordinating advances in production and processing technology, market research, and training for the pork sector. It's close links with all sectors of the pig marketing chain mean that DS stays extremely well informed about developments within the chain and can respond quickly to changes in the production and marketing environment. Perhaps one of the most unique features of DS is that because it represents many stages of the pig marketing chain, adversarial relationships between buyer and seller, which are common in the marketing chains of meat industries in many other countries, appear to be largely absent. Instead DS fosters a cooperative spirit permeating the whole Danish pork industry.

The collective strategy of the Danish hog and pork industry is not to produce a bulk homogeneous product in the largest quantity possible, but to produce a high quality, market specific, differentiated set of products. The focus is on product competitiveness rather than cost competitiveness.

In summary, the Danish industry is export oriented, vertically integrated, focused on meat quality, food safety, and quality control. In terms of cost of production, Danish pork production is estimated to be about 33% higher than Ontario's. The branding of pork which has occurred in Denmark relates to health status and rearing practices rather than genetics and feed regimens.

THE SMITHFIELD SYSTEM

Smithfield Foods is the largest pork processor in the world, with fiscal 2001 production of 6 billion pounds of fresh pork and processed meats (they process over 20 million hogs annually). They supply food service customers and retailers and own some of the most popular retail and food service pork brands in the world. Beginning in 1998, Smithfield Foods expanded beyond U.S. borders with acquisitions in Canada (Schneiders), France (Animex), and Poland. In 1999, the company further developed its international operations through a 50% owned integrated pork venture in Mexico. Smithfield Foods is the largest hog producer (12 million hogs or 3.5 times more than the nearest competitor) in the world and is committed to vertical integration to ensure a steady supply of raw materials and tame industry cycles. Through its hog raising and pork processing subsidiaries, the company can exercise complete control over its products from their genetic lines (NPD genetics account for 55% of total herd) and nutritional regimen to how they are processed, packaged and delivered to the end user. They own and operate hog farms with about 700,000 sows in North Carolina, South Carolina, Virginia, Utah, Colorado, Texas, Oklahoma, South Dakota, Missouri, and Illinois plus another 40,000 in Mexico, Brazil and Poland.

Smithfield Foods is actively attempting to expand their branded meat sales. The intent is not simply to sell commodity fresh pork, but rather to improve profitability by achieving parity between branded value-added fresh pork and high-value processed meats. In fiscal 1994, the Company's subsidiaries produced about 660 million pounds of processed meats. In fiscal 2000, the total was more than 2.2 billion pounds. The value-added branded labels used by Smithfield include: Lean Generation, Smithfield Premium Tender'n Easy, John Morrell Tender N Juicy and Gwaltney Tender Perfection. Branded fresh pork now accounts for 40% of the fresh pork available for branding which is triple the percentage of four years ago. Case-ready sales volume have also increased substantially with Wal-Mart their major customer (52 million pounds in 2001 in over 40 states). Some of the stated benefits of case-ready are: freshness, food safety, and substantial cost reduction. Smithfield feels that the growth of their branded, case-ready and value-added fresh pork sales lessens their exposure to the commodity side of the business.

In summary, clearly Smithfield is moving quickly away from commodity fresh pork to branded case-ready product or processed meats. Currently, the Smithfield strategy is to gain

market clout by reducing their vulnerability in the pork commodity markets and gain consumer loyalty for their brand products thus gaining greater supply chain power over both independent producers and the major retail chains.

IMPLICATIONS TO THE ONTARIO INDUSTRY

Clearly with the amount of industry consolidation occurring throughout the entire North American supply chain (i.e. producer, packer/processor, and retail levels) it will be very hard for independent producers to differentiate, brand, and develop new products to gain much market clout. While recent economic literature states that industry structure (i.e. number of firms) is not that important to industry competitiveness, it still seems difficult to conceive how independent producers will offset the market power of a large vertically integrated firm given that individually, producers lack the scale and expertise required for new product development.

The reasons for the increasing integration observed across the U.S. industry are: (i) product quality and level of consumer services (i.e. anticipate consumer preferences and translate these into animal and product specifications); (ii) operating efficiency i.e. the industry's large investment in fixed assets must operate near full capacity to hold down costs; (iii) manage risks; and (iv) gear their capacity to work with large, growing and efficient retailers in providing affordable and/or desirable products for consumers. Given these reasons for increasing vertical coordination the fundamental question becomes "How can Ontario build a vertical coordinated system?". It would seem that independent producers and packers must give up some of their individual autonomy or risk being either dictated to in terms of how and what to produce or worse being shut-out of the market place by a system that can provide the volume, quality, traceability, and desired meat characteristics demanded by the market. The evidence provided points toward the need to move quickly into the branded, value-added processed meat and case-ready markets.

Ontario is positioned well to move into these expanding markets, however, the current independent relationship between producers/packers/retailers limits innovation and information flow. Ontario needs to look vertically integrated to reap the benefits listed above and develop a strategy similar to the Danes of competing on products rather than commodities.

This could be accomplished in Ontario by building producer profiles and putting together marketing pods that produce hogs of similar carcass characteristics, health standards and feeding regimes. Hopefully sufficient volume could be achieved so that plant efficiencies in terms of slaughter, processing, storage and handling could be achieved. Significant investment must be made into new product development and consumer market analysis if the producers are to avoid the trap of being simply input suppliers. This will take a significant mind change by producers and packers. However, the timing is right for this discussion because producers are feeling vulnerable and processors are feeling powerless with the major retailers dictating the terms of the agreement.

Generally speaking, Ontario is not big enough nor suited for the low margin, high volume, undifferentiated commodity pork markets. Ontario packing plants are small by U.S. standards but remain quite competitive in terms of line speeds and other operating efficiencies. Therefore, are new business models possible between producers and packers to give the look and feel of being vertically integrated? Experimentation into these models is needed on an equal basis in terms of risk taking, capital investment, and human expertise.

In conclusion, the Ontario industry is at a cross roads in terms of how to position itself structurally. There is insurmountable evidence that industry consolidation will continue and that the industry must adopt a vertically coordinated look if it wants to avoid the risk of being uncompetitive. The approach of vertically integrating in Ontario is dubious from an environmental perspective. It would seem more logical to harness independent producers with similar production profiles to fit specific market needs. Significant capital investment must be done in new product innovation and market development to connect market seams to producer groups. Independent packers also appear very vulnerable because they are locked into commodity markets and are attempting to source hogs either through direct ownership or simple marketing contracts. Based on European experience, it would appear retailers are poised to assume the role of supply chain captain by dictating product specifications and developing brand labels.

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