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## INDUSTRY HIGHLIGHTS

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## Penicillins

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A large number of natural penicillins are known of which only penicillins G and V are produced in the country. While some quantities of these are directly used for making formulations, the rest are mainly converted into injectable sodium and procaine salts. A part of penicillin G is also used for making injectable benzathine penicillin. Recently, one company has started making 6-amino-penicillanic acid (6-APA) from penicillin G.

### Demand:

The Working Group on Drugs & Pharmaceuticals of the Planning Commission had estimated the demand for

penicillins at 415 mmu in 1979-80, going upto 700 mmu by 1982-83 and 875 mmu by 1983-84. These figures include the requirements for direct formulations as potassium, sodium, procaine and benzathine penicillins as well as for conversion into 6-APA. During 1980-81 about 100 mmu are expected to be used for making 6-APA and the requirements of penicillins may, therefore, be of the order of 430 mmu. In 1981-82 the demand may go upto 550 mmu.

### Supply:

The following is the break-up of the approved capacity as on date for the basic production of penicillins :

Company	Approved capacity (mmu)		
	Industrial Licence	Letter of intent	Total
Indian Drugs & Pharmaceuticals Ltd., Rishikesh	230	—	230
Hindustan Antibiotics Ltd. Pimpri	84	76	160
Alembic Chemical Works Co. Ltd., Baroda	100	—	100
Standard Pharmaceuticals Ltd., Serampore	40	45	85
		G. Total	575

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The total production of penicillins in 1977-78 was about 312 mmu which increased only marginally to 320 mmu in 1978-79. During April to December 1979, it was 241 mmu and the production is likely to remain at 320 mmu during the year 1979-80. In 1979-80 there was negligible conversion of penicillins to 6-APA. However, during the next year if the 6 APA plant already commissioned achieves normal production, it would consume about 100 mmu of penicillin G and in that case there is likely to be some shortage of the latter, if indigenous production does not keep pace with demand. However, there is every likelihood of the production increasing as two units are in the process of completion of their expansion programmes and another unit is likely to raise its current level of production by using a high potency strain.

#### Growth rate:

Past (1970-80): Average about 4.45% per year

Future (1980-84): Expected to be 20-22% per year, mainly on account of semi-synthetic penicillins.

#### Price:

The current approved prices for various penicillins are:

Item	Rs. per B.U.
Potassium penicillin G IP	644
Sodium penicillin G	639
Procaine penicillin G	595
Potassium penicillin V	942
Potassium penicillin Ist crystals	431

#### Outlook:

As per the New Drug Policy (1979) the basic production of penicillins is reserved for the public sector. Basic production is capital intensive and its economics depends very much on the technological inputs. While ten years ago producers were satisfied with a broth potency of 6000 to 10,000 units/ml in a seeding to harvesting time of about 180 hours, today an average potency of less than 20,000 units/ml in 200 hours is not considered economical. Plants in operation elsewhere have an average potency of more than 30,000 units/ml and sometimes as high as 50,000 to 60,000 units/ml. The recovery efficiency has also been increased considerably from about 45 to 65% from unfiltered broth to potassium penicillin. Today an yield of 60 B. U. per M<sup>3</sup> of fermented broth per month in terms of potassium penicillin is considered satisfactory.

The demand for penicillins in the form of formulations such as potassium, sodium, procaine and benzathine salts/complexes is expected to grow at the rate of 4 to 4.5% per annum. The demand for semi-synthetic betalactam antibiotics such as ampicillin, amoxycillin, epicillin, cloxacillin, dicloxacillin etc. is also likely to increase substantially from the present level of about 100 MT (1978-79) to 220-250 MT by 1983-84, which would result in raising the consumption of penicillin to 475 mmu by 1983-84. Some medium and long-acting penicillins like procaine-penicillins and benzathine-penicillins are likely to enter the market in hitherto unexplored rural areas. At the same time the market in urban areas may not grow due to the widespread development of penicillin-

resistant micro-organisms as well as the risk of occurrence of systemic reactions and on account of the availability of the safer erythromycin, broad-spectrum tetracyclines, chloramphenicol and long-acting sulphas. At best, hospital consumption might show a marginal increase.

If the manufacturers of betalactam

antibiotics base their production on 6-APA made from indigenously produced potassium penicillins G and V only, it would lead to establishment of new capacities. The potential for conversion of potassium penicillins into semi-synthetic betalactam antibiotics is so high that the present annual growth rate of 4-4.5% for penicillins may well go upto 20-22%.

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