PROGRESSIVE AGRICULTURE *in Arizona*

JULY/AUGUST 1975 • THE COLLEGE OF AGRICULTURE • UNIVERSITY OF ARIZONA • TUCSON 85721

The Cattle Industry in Arizona

In This Issue . . .

The Arizona Cattle Growers Association asked the University of Arizona's College of Agriculture for a complete, yet concise, review of cattle ranching in Arizona. The result, we felt, was a highly readable portrait of what the rancher faces and what the consumer needs to appreciate about the industry. At a time when the price of beef is still subject to debate and fragmented analysis, authors Menzie and Archer take the reader from frontier to feedlot and from hoof to shelf *and document their findings.*

In Memoriam

William C. "Bill" Davis

1916-1975

For so many years, the spirit of the Arizona Cattle Growers Association.

Acknowledgments

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--E. L. Menzie and F. Archer

On the Cover . . .

Summer rains hadn't yet turned the San Rafael Valley green when these Herefords were caught grazing in noon shade. But springs in this part of the San Rafael Cattle Company's huge spread south of Sonoita keep things pretty lush anyway.

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David Hoyt, Editor.

Cattle Ranching in Arizona

by
*Elmer L. Menzie and Thomas F. Archer**

HISTORY AND BACKGROUND

Spanish and Mexican Influence

The origin of cattle ranching — as we know it in Arizona — has been traced as far back as the early 16th century during the Spanish exploration of what is now northern Mexico and the states of Arizona and New Mexico. The Conquistadores moved north from Mexico, bringing herds of livestock with them to be used as food during their long explorations of New Spain. Many of these animals escaped into the wild where they produced offspring which were to form the first herds of cattle found in what is now the United States.

It is not known precisely when a conscious effort to introduce cattle raising into Arizona was attempted, but most evidence points to a time during the latter half of the 17th century. The Spanish policy at that time was to encourage stock raising in order to achieve a more stable settlement. This gave its colonists reasons to remain in the New World instead of merely exploiting its riches and returning to Spain. It was also an attempt to pacify and initiate the various Indian tribes to the Spanish way of life.

Spain's domination of the native tribes in the Southwest increased through the first part of the 18th century. Eventually, their heavy-handed treatment caused uprisings and revolts by several of the tribes in the mid 1700's and resulted in the decimation of many of the existing herds. As a result, the development of cattle ranching in the area was set back for a period of time.

By 1800 stock raising was once again on the upswing. Reduced friction with the Indian tribes resulting from a more reasonable policy toward them by the Spaniards helped the industry. However, a revolt against the Spanish domination of Mexico was precipitated in 1810, and the soldiers guarding the northernmost territories moved south to participate in the war. This left the haciendas and other settlements at the mercy of the Indians. Most of the colonists who survived were driven to seek refuge in Mexico. Many of the herds of cattle and horses were left to go wild during this turbulent period.

The Spanish Colonial government collapsed in 1821 and self-rule came to Mexico, but its northmost territory continued to be politically isolated for the next quarter century. Development and expansion of the cattle industry in New Mexico (which at that time included what is now Arizona) suffered during those uncertain times. It was not until a border settlement between Mexico and the United States was concluded that cattle ranching began to realize its role in the settlement of the Southwest.

U.S. Acquisition of the Southwest

Expansionism was a popular item in the United States during the first part of the 19th century. Great areas of land such as the Louisiana Purchase had been acquired early in the 1800's and President Jackson had attempted to buy the Pacific Southwest region from Mexico in 1835. His plan was to obtain California and secure a southern railway route to that area. The secession of Texas from Mexico in 1845, and its subsequent petition for statehood, precipitated the two-year-long Mexican War which resulted directly (or indirectly) in the final massive territorial acquisition by the United States.

At the outset of the war with Mexico, the settlement of the Southwest was not going well. The remoteness of the area from major population centers in Mexico made it difficult to provide protection from Indian tribes in the area. Many ranches were abandoned, the occupants were killed or driven to seek refuge in Mexico, and the stock were allowed to roam free and eventually became wild. After the Peace Treaty of Guadalupe Hidalgo was concluded in 1848, Mexico ceded some 334 million acres involving the current states of California, Nevada, Utah, Arizona, and parts of Colorado and New Mexico. For this acquisition Mexico received $15,000,000 or roughly 4.5 cents per acre.

The final border settlement between the two nations was concluded by the Gadsden Purchase some

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six years later. This transaction included roughly the lower third of New Mexico and Arizona south of the Gila River. The part of Arizona that had experienced the most Spanish and Mexican settlement had finally become part of the United States. Mexico received $10,000,000 for this final acquisition by the U.S.

After the border disputes were settled and New Mexico (including Arizona) became a United States territory, interest in settlement of the area increased due in part to the discovery of gold and silver in Arizona and California. The California gold rush opened up a new, high-priced market for beef which encouraged Texas cattlemen to drive their herds across the new territory to California. Attacks by Indians destroyed or scattered some herds, while others were kept in Arizona as cattlemen decided to forego the profits in California. Even with renewed interest in settling Arizona and other nearby territories, the growth of organized ranching lagged because of increased Indian activity, Mexican banditry and general lawlessness in the area.

The Civil War

The outbreak of the Civil War in 1862 seriously disrupted further development insofar as it affected Arizona's chances for early status as a territory separate from New Mexico and its attending Army protection. However, Arizona did acquire separate territorial status in 1863 and the town of Prescott was designated the territorial capitol. Toward the end of the Civil War a campaign by the Army to subdue the native tribes of the Southwest was renewed with a greater intensity resulting in a great influx of troops into Arizona. Their arrival opened up a substantial beef market for the local ranchers.

Post Civil War Settlement

Actions by the Army toward the Indians contributed to the rapid entry of cattle and cattlemen-settlers into Arizona and opened the way for the modern period of development. The cattle industry in the state began to boom due to the abundance of free land and the pacification of Indians in the area. As the number of Indians on the reservations grew, their need for meat increased — offering a new market for Arizona beef. The territory became more and more domesticated with the arrival of miners, farmers and supporting businesses.

The railroads also had a great impact on the growth of the fledgling cattle industry. They provided transportation for Arizona beef to the markets in California and the Midwest, returning with new settlers and supplies.

Recent History

The mild climate, the lush grassland, and the fact that most of the range could serve no other useful purpose brought about rapid growth and development of cattle ranching in Arizona. The extension of the transcontinental railroads in the 1880's led to an influx of settlers and the introduction of superior European breeds of cattle from the East. The ensuing years saw the introduction of barbed wire and much of the once open range was fenced. During the late 19th century much of the range became overstocked, resulting in over-grazing and a scarcity of forage. This condition forced removal of many cattle despite prevailing low prices at the time. With reduced grazing and improved weather, the range recovered and eventually allowed greater numbers of cattle to graze. Prices increased, and cattlemen prospered for awhile. Another drought occurred at the turn of the century however, clearly defining the "boom or bust" characteristic of the ranching industry.

The question of statehood for Arizona held significant implications for the cattle industry. Arizona first petitioned for statehood in 1892 but was rejected by the U.S. Senate at that time. Most stockmen were fearful of statehood, because of the prospect of increased taxes on a small population base. The implication for the cattlemen of transfer of lands from federal to state authority and the needs of the state for revenues to support schools and other activities were also of concern. Arizona finally achieved statehood on February 14, 1912.

In the early decades of this century, the cattle business became more closely organized and supervised, including the development of extensive fencing of private land and new watering facilities. Little new land was available and investment requirements were increasing. Fortunately, market values and production technology also improved.

The cattle industry in Arizona has experienced wide fluctuations in numbers. Between 1890 and 1920, numbers of cattle and calves ranged from 850,000 to a peak of 1.7 million in 1918. Between 1918 and 1929 numbers declined to 735,000. Between 1931 and 1950 ranch cattle numbers were fairly constant at between 700,000 and 800,000 head. Following 1950, total inventory numbers of cattle and calves increased significantly, largely as a function of growth in cattle feeding. Ranch cattle numbers have remained at about 750,000 head.

The reductions in ranch cattle numbers since 1920 and improved practices have contributed significantly to better range conditions. In addition to the reductions in cattle, many sheep ranches have been turned over to the cattle industry. Stock sheep numbers declined from 1,070,000 in 1930 to 401,000 in 1974. Assuming a sheep to cattle ratio of 5 to 1, the reduction of 669,000 sheep was equivalent to a decrease of 133,800 head of cattle.

Prices have also fluctuated, generally decreasing as numbers increased. The average value per head at $44.00, in 1919, was the highest to that date. Values dropped after World War I, then rose to nearly

$50.00 in 1929. The value per head fell to a low of $15.40 in 1934.

From 1934 to the time of the Korean War in 1952, there was a period of nearly continuous increases in the value of cattle, to an average of $179.00. Values subsequently fell to about $85.00 per head by 1956. Prices have fluctuated since 1956 but the trend has been upward. The average value per head, January 1974, was estimated at a record high of $325.00. However, values declined significantly in later months of 1974.

THE ECONOMIC IMPORTANCE AND CHARACTERISTICS OF RANCHING IN ARIZONA

Ranching's Contribution to the Agricultural Economy in Arizona

The cattle industry, including cattle feeding, has become the single greatest contributor to the agricultural sector in Arizona in recent years. In the 1930's [2] and 1940's [3] sales of cattle and calves mainly from ranches contributed about 22 percent of the cash income from the marketing of farm and ranch products for Arizona, usually ranking behind cotton in importance. In the decade from 1950-59, the total agricultural economy was on the rise due in part to the increased importance attributed to cotton growing in that decade. At the same time the cattle industry contributed only 20 percent to the total agricultural income for Arizona [7].

Total sales of cattle and calves in Arizona have grown rapidly in the past 20 years largely as a function of the expansion of cattle feeding. There are no exact figures available on the amount of sales of cattle and calves from Arizona ranches but estimates can be made on the basis of calves produced. There were an estimated 290,000 calves produced on ranches in 1974. About 49,000 were retained for replacements, leaving approximately 241,000 calves for sale. Assuming an average of 400 pounds — at the average 1974 price of $38.00 — the total value of the calves would have been $36.6 million. The cull cows (replacements minus death losses) were estimated at a sale value of $8.2 million for a total of $44.8 million.

According to the 1969 census data there were 988 cattle ranches in Arizona. The greatest share of the land associated with these ranches is leased from State or Federal Government Agencies. There were 105 livestock ranches reporting sales in excess of $100,000. The greatest share of ranch output came from 423 livestock ranches with sales exceeding $20,000 [10].

Although the importance of ranching has diminished relative to cattle feeding in the last decade or so, it nonetheless accounts for a sizeable portion of the agricultural economy. In 1973, the estimated value of ranch production was sixth in importance following fed cattle, cotton, vegetables, dairy products and hay. Ranches provide an important contribution to consumers' protein requirements, employing range land which has relatively few alternative economic uses.

In comparison to other sectors of the agricultural economy, ranching has been a relatively small employer of hired help, reflecting the family enterprise nature of ranching in Arizona. In 1964, all livestock ranches spent $3,897,675 for hired labor (excluding machine hire) compared to just over

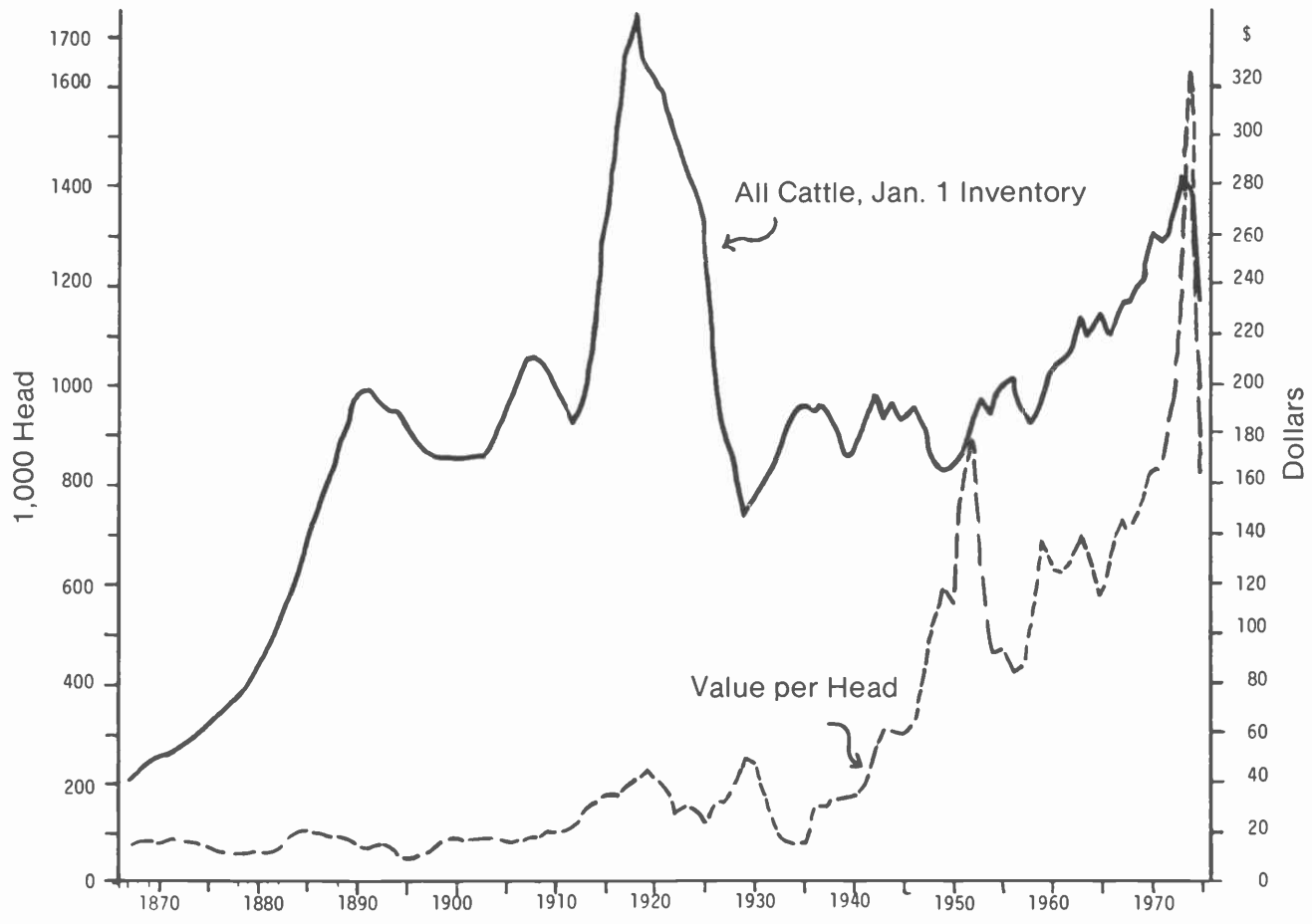


Figure 1. All cattle, number and value per head, Arizona, Jan. 1, 1867-1975.
Source: *Arizona Agricultural Statistics,* Bulletins S-1 through S-10, Arizona Crop and Livestock Reporting Service, Phoenix, 1966-1975.

$5,000,000 in 1969. However, the numbers of regular workers (defined as working 150 days or more) declined from 1,416 in 1964 to 1,048 in 1969. The greater expenditure in 1969 reflects higher wages per worker and increased use of part-time employment [10]. The total expenditure for hired labor by livestock ranches constituted only 6.7 percent of the expenditure for hired labor by all of the agricultural sector in 1964 and 7.8 percent in 1969. The largest part of this labor expenditure was for activities associated with cattle ranches.

Characteristics of the Industry

Cattle and Calf Inventory: As indicated earlier, there have been wide fluctuations in cattle numbers in Arizona. Peak numbers, largely ranch cattle, were recorded in 1918 at 1,750,000 head (Figure 1). They declined to less than one million from 1929 to 1959 some of which were in feedlots in the latter years. Since 1970 beef cow numbers have ranged between 341,000 and 372,000 head. The total inventory of ranch cattle January 1, 1975, was estimated at about 700,000 head. The beef herd is made up predominantly of the Hereford breed.

The calf crop, which constitutes the "output" of the ranch industry, declined along with the total numbers of cattle to a low of 244,000 in 1929 from 484,000 in 1924, or almost 50 percent (Figure 2). The crop increased to over 300,000 head in 1932, and has fluctuated between 300,000 and 425,000 since then. During most of the past 10 years the calf numbers have remained fairly stable at between 330,000 and 350,000 head. About 45,000 of these are estimated to be dairy calves. Death losses for calves have ranged between 20,000 and 25,000 with about one-half this number for older ranch cattle. Replacements for cows have averaged about 45,000 per year. Therefore, the industry has in recent years been producing 220,000 to 230,000 calves per year for sale off the ranches in addition to sales of cull cows.

Industry Productivity: Productivity levels on Arizona ranches have been gradually rising. The major contributor to improved productivity is good management. Herds must be well maintained by culling weak and unproductive animals, and through improved breeding and feeding. Low fertility rates, and slow growth rates for nutritional, hereditary, or other causes reduces productivity. Care must be taken to reduce losses from disease, parasites and predators.

Proper grazing and supplemental feeding practices are important to ranch productivity. While climatic variations may make planning difficult, ranchers can and do maintain herd levels in relationship to the usual optimum carrying capacity of the range. Improved management of range use with significantly reduced stocking rates have helped to maintain range capacity, and thereby increased the productivity of the industry.

Up to the time ranch cattle numbers peaked in the 1920's, range management and use policy generally encouraged overgrazing. The open range system did not reward the individual for employing conservation practices. With the development of range use policies in the 1920's and 1930's, in recognition of the individual ranch with grazing rights as well as responsibilities, improved management practices were soon instituted. The most significant change was the gradual reduction in stocking rates.

Improved management has resulted in a significantly larger calf crop and a faster rate of turnover per unit of land (or per cow). In the early ranching days the calf crop was often as low as 40 percent versus 80 to 85 percent in recent years. Mortality rates after weaning have declined from 10 to 15 percent to the current rate of 3 to 5 percent. Ranch heifers more commonly have the first calf at two to two and one half years of age versus three. Calves are now commonly sold at 400 to 500 pounds weight within a year to be placed on a pasture or in a feedlot elsewhere. From 50 to 80 years ago, ranchers commonly

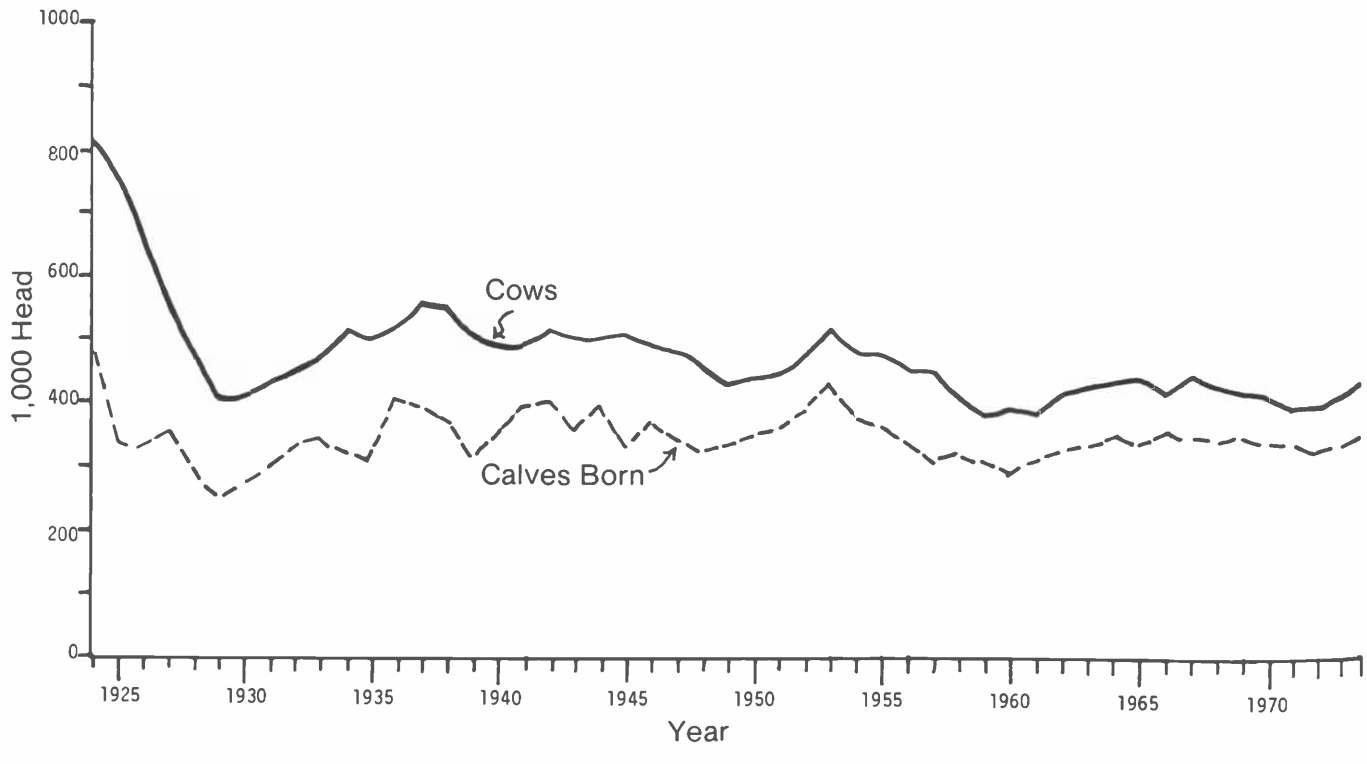


Figure 2. Numbers of cows and calf crop, Arizona: 1924-1974 (includes Dairy Stock).
Source: *Arizona Agricultural Statistics,* Bulletins S-1 through S-10, Arizona Crop and Livestock Reporting Service, Phoenix, 1966-1975.

sold cattle direct to market at 800 to 900 pounds at three to four years of age. The improved calf crop, lower death rates and faster turnover have significantly increased the range productivity.

Investment: Present-day ranches require a much larger investment to operate and sustain productivity levels. The land area owned by the ranch generally is not large. However, the investment in land use rights associated with the privilege of grazing on public lands tends to be large. The value of grazing permits has been capitalized into the system and is a significant part of any modern ranch investment.

Land clearing, reseeding and fertilizing require considerable capital. Fencing, water development, veterinary assistance, medicines, vaccines, and supplementary feedstuffs add to ranch costs as do increased investments in land, machinery and equipment.

Since the inventory of ranch cows and heifers has been at about 350,000 the average ranch size is 350 cows. The estimated total investment per brood cow on Southwest ranches was $2,000 in 1972 with $1,600 in real estate and improvements [11]. It is believed the average for Arizona may be somewhat lower largely because there is less owned land. If real estate and improvements were valued at $1,000 per cow, the total investment in the state in 1972 would have been $350,000,000. Assuming livestock and equipment to be valued at $400, the investment would have been $140,000,000. The total investment would therefore amount to $490,000,000 or approximately $490,000 average per ranch.

CHARACTERISTICS OF ARIZONA'S RANCH AREAS AND RANCHING

Ranching Areas

Although cattle ranching is statewide in scope, the ranches are by no means homogeneous as far as vegetation, rainfall, elevation, topography, etc. are concerned. Largely based on these differences, the state may be divided into five general ranching regions, each with certain characteristics which distinguish it from the other four (Figure 3). These are described below [5,8].

The Arizona Strip: The Arizona Strip lies north of the Colorado River and west of the Indian reserva-

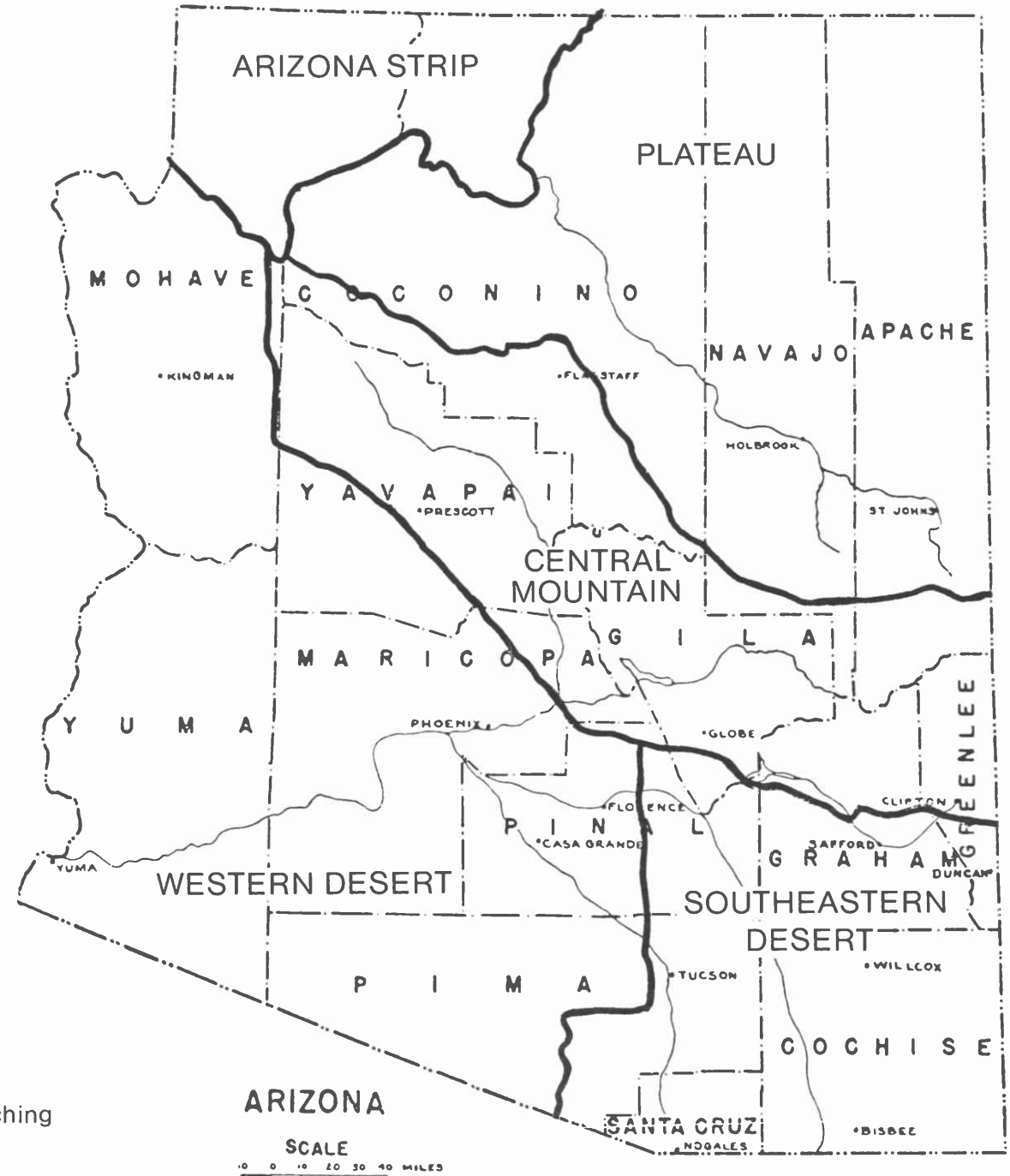


Figure 3. General Ranching Areas of Arizona.

Voight cattle in the White Mountains (now Lesueur cattle)

tions. The area has been classified as 40 percent pinon-juniper, 40 percent sagebrush and other shrub, 12 percent open conifer forest, and 8 percent grassland. The major topographical features are broken plateaus, bushlands and low mesas. Most of the region lies between 5,000 and 6,000 feet elevation with mountain peaks of over 8,000 feet. Annual rainfall averages 9.0 to 9.5 inches, occurring largely during the summer months.

Western Desert: The Western Desert area lies mostly below 2,000 feet elevation. The topography is basically flat plains cut by washes and separated by low rugged ridges. The annual rainfall is from 5 to 10 inches with precipitation falling below 5 inches on the westernmost boundary.

The vegetation of the area consists of filaree and Indian wheat grass for spring feed and galleta and grama grasses for summer forage. Available browse plants and shrubs are guajilla, saltbush, mesquite, sage and palo verde. Creosote bush is also common but of little forage value. Summer rains may bring a growth of perennial grasses during July and August. Some supplemental feeding of livestock is usually required in this region.

The Western Desert area supports cow-calf operations which rely primarily on browse through the drier months. Ranches are organized to utilize annual grasses for stocker steers during wet springs, which occur about once every four years.

Southeastern Desert: The Southeastern Desert area lies mostly between 2,000 and 4,000 feet. Mountain ranges average 6,500 to 7,500 feet with some peaks over 9,000 feet. Rainfall ranges from 10 to 15 inches annually, generally received during late November through February and the months of July and August.

The land of the western portion of the area is, generally, a sloping plain and is cut by numerous washes. The eastern side may be described as a broad desert area broken by individual mountain ranges, creating a wide variety of vegetative types. The area supports year-round grazing for cow-calf operations, based mainly on forage grasses during the winter and spring and browse during the drier summer months. The area has several different types of vegetation consisting of southern desert shrub forage, breaking into desert grassland at higher elevations. Perennial grasses are scarce in the western part of the area but annual grasses may flourish following spring rains. The major browse plant is desert saltbush with mesquite, palo verde and white bur sage furnishing some limited forage. Grama grasses and guajilla are important forage plants in the grassland areas. Pinon-juniper is found in the foothills and pine and fir trees in the mountain ranges.

Central Mountains: The Central Mountain area is considered one of the most rugged regions of the state with isolated mountain ranges cut by canyons and gorges. Intermittent streams usually are found at the bottom of the canyons. Elevations vary from 3,500 to 8,000 feet with some peaks near 12,000 feet. Average annual rainfall is 18 to 19 inches with a range of 10 to 30 inches depending on elevation.

The area includes open grassland, oak woodland or chaparral, pinon-juniper and forest tree types. The high elevations above 7,000 feet are used largely for summer grazing. On the open grassland below 6,000 feet, blue grama, curly mesquite, sacaton and needle grasses are the prominent species. The oak woodland or chaparral occurs at 3,500 to 5,000 feet elevation and consists of scrub oak, huckbush, mountain mahogany, cliff rose and cat claw. Pinon-juniper is found in a range of 5,000 to 6,500 feet elevation. Forage plants are primarily grama grasses and galleta grass with a few palatable shrubs. Forest trees grow at elevations above 6,000 feet.

The open mountain parks are used for summer grazing. The principal types of forage are blue grama grass, blue stem, mountain muhly, Arizona fescue and beardless bunch grass.

Plateau: The northeastern corner of the state is a large plateau varying in elevation from 4,000 to 7,500 feet except for some scattered peaks. Essentially it is the lower drainage for the Little Colorado and Colorado Rivers. Much of this area incorporates parts of the Navajo and Hopi reservations and is used primarily for grazing Indian sheep and goats with relatively few cattle. South and west of the reservation is a large grassland of shortgrass and bunch grass types. Blue grama, sand dropseed and Indian rice grass are examples of the predominant species of the area. Browse plants of the area include sagebrush, black brush and salt bush.

Ranch Types: Cattle ranches generally fall into two major categories: the cow-calf ranch and the combination cow-calf with some yearlings. A few opera-

tions elect to graze steers, heifers and culled cows but do not keep a breeding herd. The cow-calf ranch emphasizes production and sale of calves, usually about 400 pounds in weight and six to eight months of age. In Arizona the major calving period is in early spring but some calves are produced in the fall. The major sales are in the fall with some late calves and short yearlings sold in the following spring.

The combination ranches are also cow-calf operations. The basic difference is in keeping some (or all) of the calves over for up to an additional year to add weight and growth. Availability of forage and market prices are major factors determining whether animals will be retained and for how long. Some ranches combine mountain and semi-arid areas to provide for both summer and winter ranges.

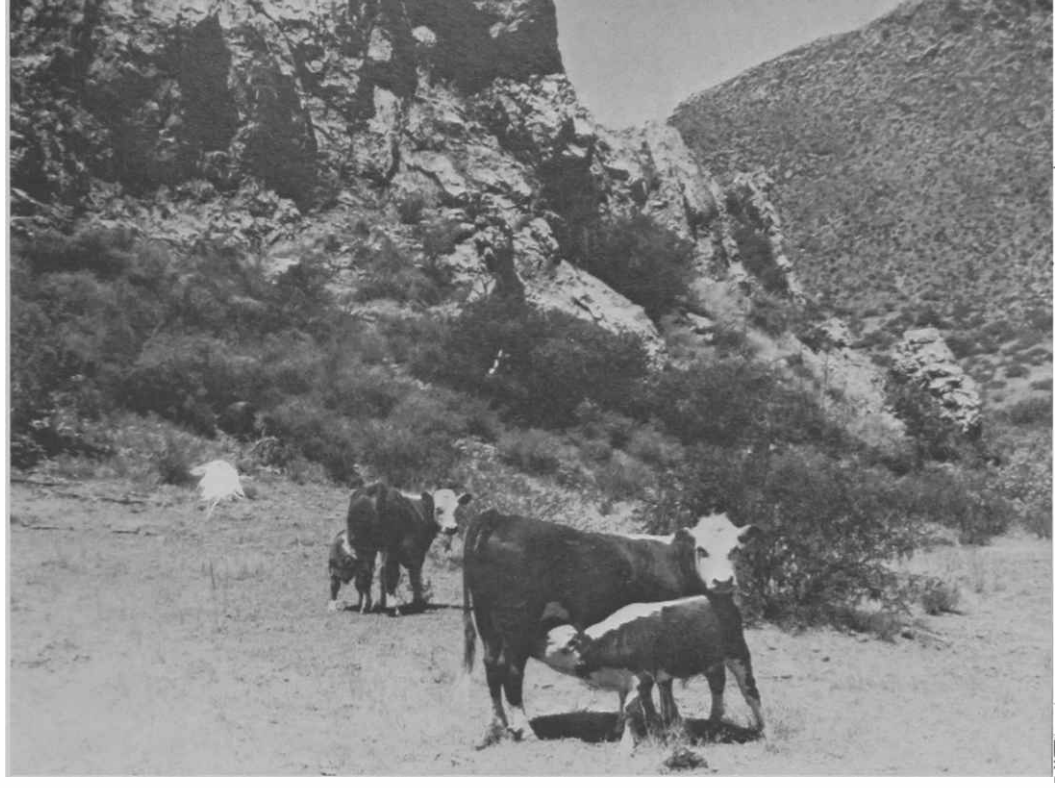
Some ranchers specialize in raising purebred stock for breeding purposes.

Ranch Life: Ranching appeals to many people in different ways. Those originating in urban environments may envisage ranch life on the basis of a vacation experience or brief visits to a relative's ranch during the summer. Many have rather glamorous notions about ranch life that are far from reality.

The type of life enjoyed by ranchers appeals to both the rancher and non-rancher. Most ranchers seem to prefer ranching to other vocations. They see themselves as performing a useful function by helping to provide food in an environment and lifestyle they prefer. Yet the rancher's life is much different from what usually is imagined by the fascinated urbanite. The typical rancher puts in long hours of hard physical work. Very often he is alone, and the family lives in town for the school year. Inclement weather, especially during the winter, can make the rancher's life very difficult. Winter storms and cold can bring severe losses to the herd, especially among the calves upon which the rancher depends for his livelihood.

The milder parts of the year may also bring wide climatic fluctuations, drastically affecting the rancher's returns. Drought may occur as frequently as six out of ten years. This hard fact can cause the downfall of any rancher, as many oldtimers can testify. A range with a mixture of browse and grass provides a better backlog of forage as drought insurance than does straight grass range. Ranches with a pasture management system have better drought protection than those without. In severe emergencies, the rested areas provide a buffer not available on ranges grazed year-long.

The arid nature of the grazing land in Arizona requires that certain improvements be added before the land can be properly utilized. This includes such things as water developments, fences, livestock trails and control of undesirable plants. Additionally, in many areas, predator control adds to costs and ranch losses.



Florencio Hurtado Ranch at Dos Cabezas

Water developments on a typical Arizona ranch may be of several types, including wells, springs, earthen catchments or dams and, recently, horizontal wells. These should be spaced no more than two miles apart in rough country, or up to twice that far in gentle terrain. Lack of adequate stock water is often the most critical factor in the operation of an Arizona ranch, especially in a year-long grazing operation. The ranch water developments are also of significant importance in supporting wild animals, migratory birds, and water fowl.

Few Arizona ranchers operate solely on land that they own. Most ranches are composed of a combination of lands of various ownership including private land, state-owned land, public domain, and National Forest. The complex land ownership pattern of the average ranch introduces some unique problems. The rules and fees vary considerably for state and private land leases, Bureau of Land Management, and National Forest permits. In addition, there are variations reflecting local conditions, such as requirements for base or "home ranch" property in connection with leases of public land in Arizona.

Grazing cattle or other livestock on public lands has required certain compromises with other uses. The problems and conflicts of multiple use on public lands have become more acute in recent years, with the increasing demands of a growing urban population, especially for recreational purposes. Ranchers not only find themselves in a position of continually having to defend their use privileges, but are faced with new hazards and added costs associated with such things as vandalism, cut fences and opened gates. Additionally, there is increasing control of the ranch operation by State and Federal land administration agencies.

Another increasing problem for ranchers is in obtaining help. Good "hands" are hard to find or to keep. The traditionally low returns associated with

ranching have made it virtually impossible for the rancher to pay competitive wages for the kind of help needed on a modern ranch. As a result, the rancher is becoming more and more dependent on family help. During the school year this often means that major ranch work waits for the weekend when the family can come home from town. Often the most dependable cowhand is a teenage daughter, but even she is hard to keep on the ranch.

This shortage of trained ranch help has altered the method of management of many large herds. The cattleman often works continually through the spring and fall with roundup chores instead of having two large roundups, as occurred traditionally. He gathers the cattle one pasture at a time, doing the necessary branding, vaccinating, etc., often using small or even portable facilities that are moved from one location to another as needed.

Ranch Economics: Cattle ranching today involves a substantial investment. Ranches vary significantly in size, and while small units may produce economic returns as part-time operations, a fully self-supporting unit probably should have 400 to 500 brood cows, two years or older. Such an operation would involve an investment of over $500,000. Owned and leased land would involve between 55 and 60 sections depending on the location in the state.

The following budgets, providing inventory, depreciation schedules and summaries of costs and returns under alternate price situations, help to describe an average-size ranch operation in the Central

Central Arizona Mountain Ranch — 8AU/Section Carrying Capacity

INVENTORY†

Livestock	Value	
300 Cows (2 years and up) @ $250	$75,000	
40 Yearling replacement heifers @ $200‡	8,000	
20 Bulls (breeding age) @ $600/head	12,000	
8 Saddle Horses @ $400/head	3,200	
Total		$ 98,200
Building and Improvements		
House trailer for hired help (used)	$ 2,000	
Barn — metal with cement floor	8,000	
Tackroom and storage	2,500	
Corrals:		
Main	3,000	
2 holding	2,300	
Water Systems:		
3 - 6" well-windmill-pump-storage tanks, etc., @ $8,000 each	24,000	
4 - dirt tanks @ $1,300 each	5,200	
Fence — 5 strands barb wire-metal post @ $1,400 per mile (30 miles)	42,000	
Total		$ 89,000
Land		
640 acres of patented land @ $300/acre		$192,000
Machinery and Equipment		
Item	**Value**	
½-ton pickup	$ 5,400	
¾-ton 4WD pickup	6,000	
Stock truck (2 ton-rack) used	3,500	
Tractor and equipment (blade-front lift, etc., used)	2,500	
Saddles and tack (4 complete) @ $450 each	1,800	
Livestock equipment — portable chute-sprayer-veterinary equipment-branding irons, etc.	2,000	
Ranch equipment — shop tools-well tools-fence tools-fuel tanks, etc.	1,500	
Total		$ 22,700
Total Investment		$401,900

† *Values based on beginning of 1975.*

‡ *Cull 10% of the mature cows yearly — 3% death loss on cow herd.*

SCHEDULE OF DEPRECIATION

Item	Cost	Salvage Value	Difference	Years of Life	Charge per Year
Bunkhouse (trailer)	$ 2,000	$ 100	$ 1,900	10	$ 190
Barn	8,000	400	7,600	25	304
Tackroom	2,500	100	2,400	25	96
Corrals	5,300	300	5,000	20	250
Wells (3)	24,000	1,500	22,500	15	1,500
Dirt tanks (4)	5,200	—	5,200	10	520
Fence (30 miles)	42,000	2,000	40,000	25	1,600
½-ton pickup	5,400	1,200	4,200	4	1,050
¾-ton 4WD pickup	6,000	800	5,200	6	866
2-ton truck (used)	3,500	200	3,300	10	330
Tractor & equipment (used)	2,500	200	2,300	10	230
Horse tack	1,800	100	1,700	10	170
Livestock equipment	2,000	100	1,900	10	190
Ranch equipment	1,500	100	1,400	10	140
Horses (8)	3,200	400	2,800	10	280
Bulls (20)	12,000	6,000	6,000	5	1,200
Total					$8,916

EXPENSES

Livestock Feed

Horses

Hay — 10#/day @ $55/ton x 8 horses = $2.20/day
200 days x $2.20/day = $ 440

Concentrate — 3#/day @ $120/ton x 8 horses = $1.44/day
90 days x $1.44/day = 130

Bulls

Range cubes — 2#/day @ $155/ton x 20 bulls = $3.10/day
180 days x $3.10/day = 558

Cows

Range cubes — 1.5#/day @ $155/ton x 300 cows = $34.87/day
135 days x $34.87/day = 4,708

Replacement Heifers — (calves as 2-year-olds)

Hay — 4#/day @ $60/ton x 40 heifers = $4.80/day
150 days x $4.80/day = 720

Breeder cubes — 3#/day @ $155/ton x 40 heifers = $9.30/day
150 days x $9.30/day = 1,395

Mineralized salt blocks —
1#/animal/every 22 days = 16.6#/animal
16.6#/animal x $1.60/50# block x 360 animals = 191

Total $8,142

Vehicles:

½-ton pickup	15,000 miles/year @ .13/mile	= $1,950
¾-ton pickup 4WD	8,000 miles/year @ .15/mile	= 1,200
2-ton truck	4,000 miles/year @ .25/mile	= 1,000
Tractor	80 hours/year @ 2.50/hour	= 200
	Total	$4,150

Arizona Mountain area. Different circumstances, sizes of operation, prices and costs will, of course, provide other results.

The total investment for the budgeted ranch is $401,900 or $1,339 per brood cow. This is made up of $98,200 livestock, $89,000 in buildings and improvements, $22,700 in machinery and equipment and $192,000 in land. The land investment is the most difficult to estimate since the amount of acreage owned varies from ranch to ranch. It may be much more or significantly less. Additionally, the price per acre varies with the location and conditions of both the owned land and available lease acreage.

Ranch returns are highly dependent on price and ranch output. In 1974 prices were significantly higher early in the year than in the latter half. The effect of the price drop is illustrated by the two separate returns budgets. The second budget using 50 cents a pound steers and 45 cents heifers versus 30 and 26 cents, produced $20,000 more gross income. If the ranch improved its productivity, to obtain 90 percent calf crop versus 80 percent used in the budgets, the gross would increase nearly $6,000 with calves selling at the higher price level and $3,400 at the lower level.

The first budget with steers selling at 30 cents per pound suggests the ranch is operating at a loss. It may be possible to reduce some of the expenses by improved management, but the main source of additional revenue will probably have to come from an improved calf crop. The operator of such a unit will be living largely on the amount set aside for depre-

EXPENSES

Capital Investment:		
Repairs and expenses — 2% of original cost/year 2% x $89,000		= $1,780
Labor:		
Hired — 2 man-months of labor @ $20/day x 60 days		= $1,200
Utilities:		
Butane-telephone-electric @ $125/month		= 1,500
Insurance:		
Liability-fire, etc.		= 300
Veterinary Expenses:		
Cows	$ 50	
Calves @ $.30/head x 240	72	
Replacement heifers @ $4.30/head x 40	172	
Horses @ $1.00/head x 8	8	
Total	$302	= 302
Taxes:		
Cattle — $3.00/head x 360	$1,080	
Land — $.10/acre x 640	64	
Total	$1,144	= 1,144
Land Use Fees:		
300 cows x 1 x 12	3,600 AUM	
20 bulls x 1.25 x 12	300 AUM	
40 heifers x .75 x 12	360 AUM	
Total	4,260	
Forest Service Fee = $1.05/AUM x 4,260 AUM		= 4,473
Miscellaneous Expenses:		
Brand inspection — 230 head x $.25	$ 57	
Bookkeeping-office	40	
Dues-subscriptions/fees	50	
Total	$147	= 147

Central Arizona Mountain Ranch — 8AU/Section 80% Calf Crop

SUMMARY OF RETURNS AND EXPENSES[1]

Cattle Sales		
Cull cows — 850# @ $.20 = $170.00 x 30	= $ 5,100	
Calf sales[2]		
Steers — 430# @ $.30 = $129.00 x 120	= 15,480	
Heifers — 385# @ $.26 = $100.10 x 80	= 8,008	
Total		$28,588
Ranch Expenses		
Feed	$ 8,142	
Hired labor	1,200	
Vehicle	4,150	
Capital items repairs	1,780	
Utilities	1,500	
Insurance	300	
Veterinary-drugs	302	
Land use fees	4,473	
Miscellaneous	147	
Interest on borrowed operating capital	926	
Total		$24,066
Returns to labor, management, depreciation and interest on investment in capital items		4,522
Depreciation		8,916
Return to capital and management		-$ 4,394

[1]*Prices of cattle and costs of inputs based on the latter part of 1974 and early 1975.*

[2]*Based on 80 percent calf crop at weaning (83 percent calf drop with 3 percent death loss after drop), less 40 replacement heifers.*

Central Arizona Mountain Ranch — 8AU/Section 80% Calf Crop

SUMMARY OF RETURNS AND EXPENSES

Cattle Sales		
Cull cows — 850# @ $.35 = $297.50 x 30	= $ 8,925	
Calf sales[1]		
Steers — 430# @ $.50 = $215.00 x 120	= 25,800	
Heifers — 385# @ $.45 = $173.25 x 80	= 13,860	
Total		$48,585
Ranch expenses		$24,066
Returns to labor, management, depreciation and interest on investment in capital items		$24,519
Depreciation		8,916
Return to capital and management		$15,603

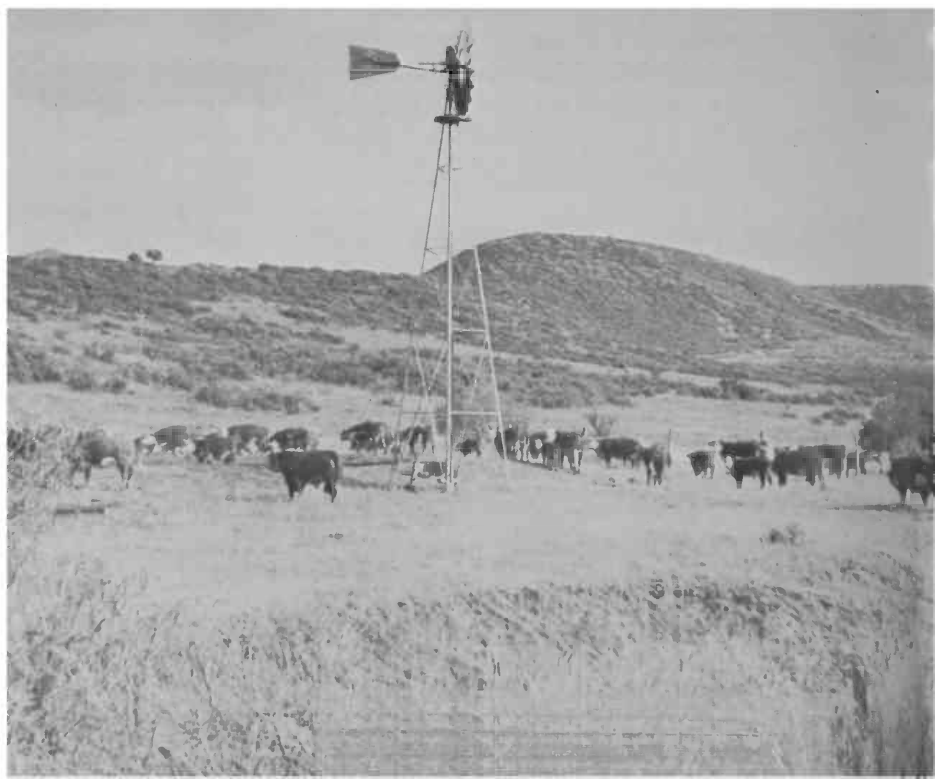
[1]*Sales prices based on quotations at the beginning of 1974.*

Near Payson (one of first ranch houses in area — homemade nails were used)

Babbitt Ranch — Flagstaff

Branding on the old Pusch Ranch, north of Tucson (1960 or earlier)

Coughlin Ranch — Yarnell



ciation, in which case the ranch could be expected to deteriorate.

The ranch has a large capital investment and at least part of this is likely to be borrowed. If capital is borrowed, the interest on that part will have to come out of earnings even if the operator forgoes any return on his own equity. At a rate of 8 percent on one-half the value of intestment in improvements, machinery and equipment, the interest would be $4,468. Interest on the livestock investment would be $7,856 or a total of $12,324 exclusive of the land. Based on the budget using the higher price for calves, this would leave a return of $3,279 to management and land.

While the returns appear small, even with relatively high prices, there are some additional compensating factors. The rancher does receive some items from the ranch which help reduce living costs. Additionally, ranch values have been appreciating. One study estimates asset appreciation for Southwest cattle ranches between 1964 and 1972 was more than double the ranch operation return to operator's labor, management and capital [11].

Indian sale at Calva

CATTLE MARKETING

In the past 45 to 50 years, marketings of cattle and calves have increased 150 percent from 536,000 head in 1925 to 1,332,000 head in 1972 [1]. Most of this growth may be attributed to the great increase of cattle marketed from Arizona's feedlots which nearly doubled from 1960 through 1972. Since 1925, marketings of nonfed cattle have fluctuated somewhat in response to such factors as price, range and weather conditions and the calf crop. In 1925 almost all of the 536,000 marketings were of range cattle and a few dairy cattle. In 1972 nonfed cattle accounted for 32 percent of all cattle and calf marketings or a total of 426,240 head.

Methods of Marketing Cattle in Arizona

Ranchers have the choice of several different channels in marketing their animals. Normally, the primary outlets used are: (1) direct sales to feeders, packers or other farmers and ranchers; (2) livestock auctions; (3) terminal markets; and (4) dealers, local buyers or commissionmen.

Direct Sales: In Arizona as well as most other western states, direct sales account for most of the marketings of both fed and nonfed cattle. Nonfed cattle are sold to dealers, feeders or other ranchers. The actual number of cattle from Arizona's ranches sold through direct marketing outlets is not known and estimates are difficult to obtain, since cattle from outside Arizona may be sold through the market outlets within the state.

The major advantage of direct sales is the reduction in marketing costs by eliminating commissions and/or handling costs. The buyers come to the rancher, who usually handles the negotiations himself. This method allows him to reject or accept bids, since his livestock remain on the ranch until the sale price has been determined. Also, shrinkage in weight associated with the transportation and excessive handling of cattle is avoided and death loss is minimal [4].

Some disadvantages also exist with direct selling. For example, ranchers failing to have full knowledge of the market may accept prices substantially lower than the going market price. Some ranchers in financial difficulties or uneasy about the market may make sales below the competitive level, which adversely influences prices of neighbor ranchers. Small ranchers tend to attract few buyers, which reduces their bargaining position.

Auctions: Substantial numbers of calves are sold through Arizona auctions. In 1949 there were only three auctions which marketed 32,600 head, while in 1964 the number of auctions grew to eight, with 348,100 head of cattle sold [6]. In 1969, there were seven regular weekly auctions — four in Phoenix, two in Tucson, and one in Willcox — handling some 213,000 head of cattle and calves. However, it is not known how many of these were calves from Arizona.

Local producers' organizations hold feeder auctions once or twice during the year, usually in the spring or the fall or sometimes both. In 1969, there were eight country Cattlemen's Association auctions handling a total of 8,691 head, and nineteen Indian reservation sales selling 12,472 head. Additionally, the Willcox auction held four special feeder cattle sales which accounted for sales of 4,943 head.

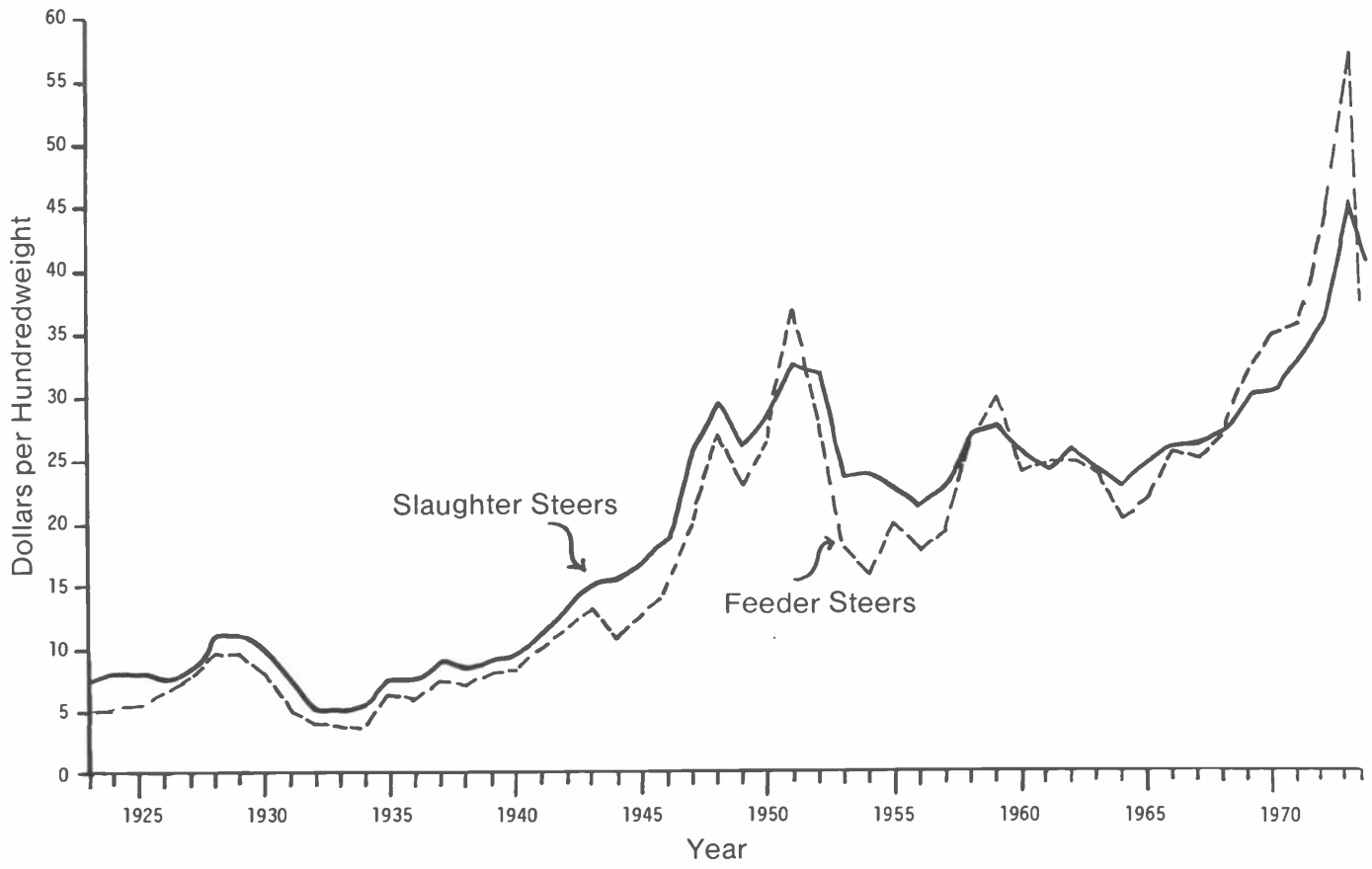


Figure 4. Average annual prices for 500-600 pound choice feeder steers and 900-1100 pound choice slaughter steers in Arizona for 1923-1974.

Source: *Arizona Agriculture* Bulletin A-74, Cooperative Extension Service and Agricultural Experiment Station, University of Arizona, Tucson, April 1974 and earlier issues.

There have been many changes in the auction market makeup in recent years. Some auctions have consolidated with former competitors, new ones have been developed, and some have ceased business altogether. In 1973 there were three weekly auctions in Phoenix, one in Tucson, one in Willcox and a seasonal auction in Prescott besides other special feeder sales.

A major advantage of livestock auctions is in providing a volume of animals at one sale time which attracts numerous buyers, thereby increasing competition. The rancher retains protection through the option of rejecting any bid considered too low. This may be accomplished by several methods. A rancher may put in a bid either to increase the price or to stop the bidding altogether by, in effect, buying his own animals. He may signal the auctioneer that the highest bid is too low and have him take the animal out of the auction or a seller may name a price below which the animal may not be sold. This is called a minimum or reservation price.

Auctions ensure prompt cash payment for the livestock, while other methods require confirmation of orders, exchange of drafts, and other delays before the seller receives his money. They are also a good alternative outlet for older cows and other less desirable culls.

Auctions also have a number of disadvantages. Charges may be high for feed and pen space for the animals. Sometimes, the sanitary facilities are less than adequate, resulting in the transmission of disease to normally healthy animals. Another criticism is that auctions attract too many low-grade animals which tends to reduce prices for better grades of animals. There may be irregular results due to variations in the number of buyers from sale to sale. Pricing efficiency resulting from variations in the estimation of grade, weight, and other quality characteristics by individual buyers may vary greatly. Nevertheless, auctions are a popular means of marketing ranch cattle. They not only provide an alternative market outlet but give ranchers an opportunity to get together on a regular basis, exchange ideas and information, and do a bit of socializing [4].

Other Market Outlets: Few ranch cattle are sold through outlets other than auctions or direct sale. In 1964, only 2.5 percent were reported sold through terminal markets [9]. This number has declined still further in the past ten years. Sales through dealers, local buyers or cooperatives also are relatively few.

Market Prices

Regardless of the method of sale used, the prime objective is to merchandise the ranch product at the highest possible price. Some ranchers probably feel frustrated with their apparent lack of bargaining power in the market. Each rancher, producing a small part of the total supply, has little impact as an individual.

Cattle prices tend to go through cycles (Figure 4). Also, until 1958 the average price of feeder cattle was consistently at a discount to the fed cattle prices. However, from 1959 to the present, fed cattle and feeder prices have fluctuated about each other. From 1969 to 1973 the average price of fed steers was significantly lower than feeder cattle prices. This situation continued until the spring of 1974, when the situation again reversed itself.

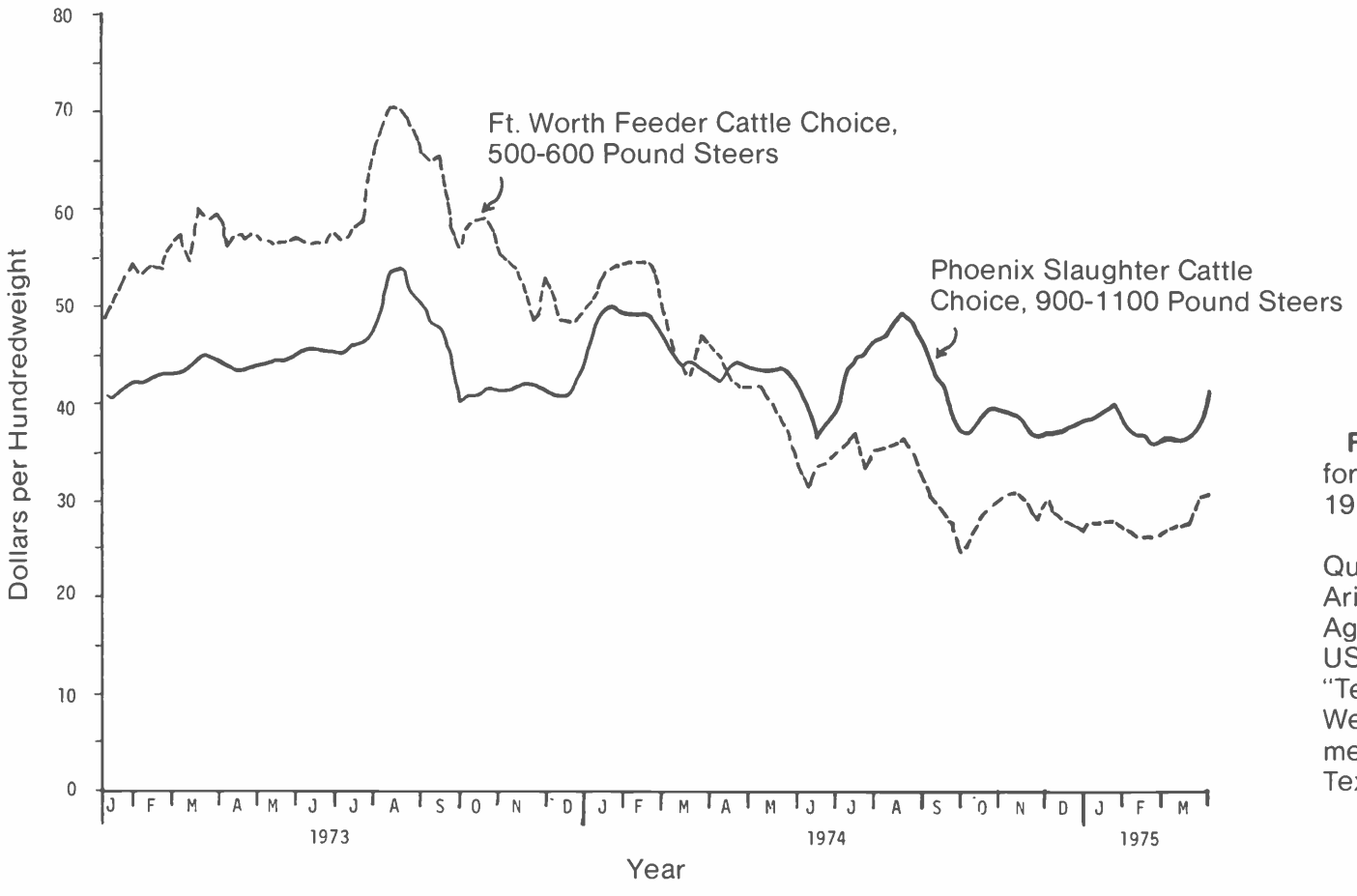


Figure 5. Average weekly prices for feeders and slaughter cattle, 1973, 1974 and 1st quarter, 1975.
Sources: "Livestock Detailed Quotations (Weekly): Phoenix, Arizona," Livestock Division, Agricultural Marketing Service, USDA, Phoenix, Arizona and "Texas Livestock Market News," Weekly Reports, Texas Department of Agriculture, Austin, Texas 1973-1975.

Price fluctuations tend to be fairly extreme. Feeder cattle prices rose from an average of $20 per hundredweight in 1964 to $54 in 1973 [1]. Then in late 1974 they declined to less than $30. These fluctuations provide considerable uncertainty for ranchers in making production plans since there is such a long time lag involved. Producers making decisions to increase production by adding to their breeding herd in a given year will not receive additional calves for delivery to market for over three years. During such a long production period prices may swing up and/or down drastically.

In addition to longer term, cyclical, price fluctuations, producers face seasonal price changes. The weekly average price for feeder steers in 1973-1974 ranged from a high of over $70 per hundredweight in April of 1973 to a low of $25 in September 1974 (Figure 5). Cattle sold in August 1973 would have brought $20 per hundredweight more than those sold in December of the same year.

The rancher must be skillful in marketing his animals as well as in production, if he is to succeed. He must determine the correct time to expand or contract production, the optimum age, weight and time to sell, and the most economic marketing channel to use for the particular situation. His expertise in making these marketing decisions is as important as any other aspect of the ranch operation.

Ranchers and Consumers

The rancher is an important part of the total system which provides Arizona comsumers with an important part of their diet. While the rancher rarely sells the product of his efforts directly to consumers, they are the final source of demand. The rancher needs the consumer and visa-versa. Just as the rancher needs to know and understand consumer wants, the consumer should have some understanding of the producers' problems in production.

The rancher, like any other producer, cannot survive over extended periods of time without returns to cover costs. Historically, there have been wide swings in price with periods during which producer returns were inadequate. These periods result in herd reductions and diminished amounts of beef for consumers with resultant higher prices. Production expansion is slow because of the nature of the process. A heifer calf generally cannot be bred and produce a calf of its own in less than 2.5 to 3 years from birth. This new calf, in turn, cannot be grown and prepared for market in less than 1.5 to 2 years. The long period required for expansion and contraction in addition to the large number of decision-makers in the industry provides the condition leading to cyclical over and under production over the long run.

Both producers and consumers find it difficult to relate prices received at one level with those paid at another. Ranchers may receive 40 cents per pound for 500-pound calves from a feedlot owner. The feedlot finishes the calf to 1000 pounds and sells it at 45 cents per pound. Thus far, the rancher was paid $200 for the calf and the feedlot owner received $450. (The latter receives the additional $250 for adding 500 pounds to the animal's weight.) The packer buys the 1000-pound animal at $450 or 45 cents per pound from the feeder. The animal is slaughtered and the carcass delivered to a retail outlet. However, the

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carcass weight will generally be no more than 620 pounds, because of the weight loss in slaughter. Even if the packer charged retailers only on the basis of the animal cost, the carcass price per pound would now be 72 cents. This may well be the charge made, since the packer receives some money to pay his costs by selling hides and other by-products. The value of these by-products does fluctuate significantly, however, which in turn affects the price the packer must receive from the retail carcass.

The retailer cuts the carcass into small cuts for sale to consumers. This process results in a further loss of weight for sale. The net retail weight sold generally will average just about 70 percent of the carcass, or 434 pounds in the above example. Assuming the retailer paid the packer $450 for the carcass, his cost per pound is $1.04 without any return for his labor, investment and risk. If the retailer adds 30 percent to cover these costs of operation, the cost to the consumer is about $1.35 per pound. The retailer obtains this average price by charging different prices for the various cuts. For example, T-bone steaks represent a relatively small part of the total carcass but are considered by consumers to be a special part. The retailer, therefore, charges much more for these steaks than for chuck steaks or roasts. In the final analysis, the relationships between supply and demand for the different products from the calf to the steak determine prices received.

The discussion of some of these aspects of industry operations should provide a better understanding by consumers of certain changes observed in the market place. At the same time the industry, including the rancher, needs to be aware of consumer wants and preferences. Consumer demands for product and service are continually changing. They are a function of family structure, incomes, alternative products and product prices, education, advertising, and numerous other factors. As these factors change, consumers' demands change. The industry must be aware of these changes, if consumers are to be satisfied and good relationships maintained between producers and consumers.

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