

# Time Trends for Livestock Production in Saskatchewan, Canada: 1905-2011



Sierra Rayne<sup>a</sup> and Kaya Forest<sup>b</sup>

<sup>a</sup> Chemologica Research, PO Box 74, 318 Rose Street, Mortlach, Saskatchewan, Canada, S0H 3E0; e-mail: rayne.sierra@gmail.com

<sup>b</sup> Department of Environmental Engineering, Saskatchewan Institute of Applied Science and Technology, Palliser Campus, PO Box 1420, 600 6th Avenue NW, Moose Jaw, Saskatchewan, Canada, S6H 4R4; e-mail: kaya.forest@siast.sk.ca

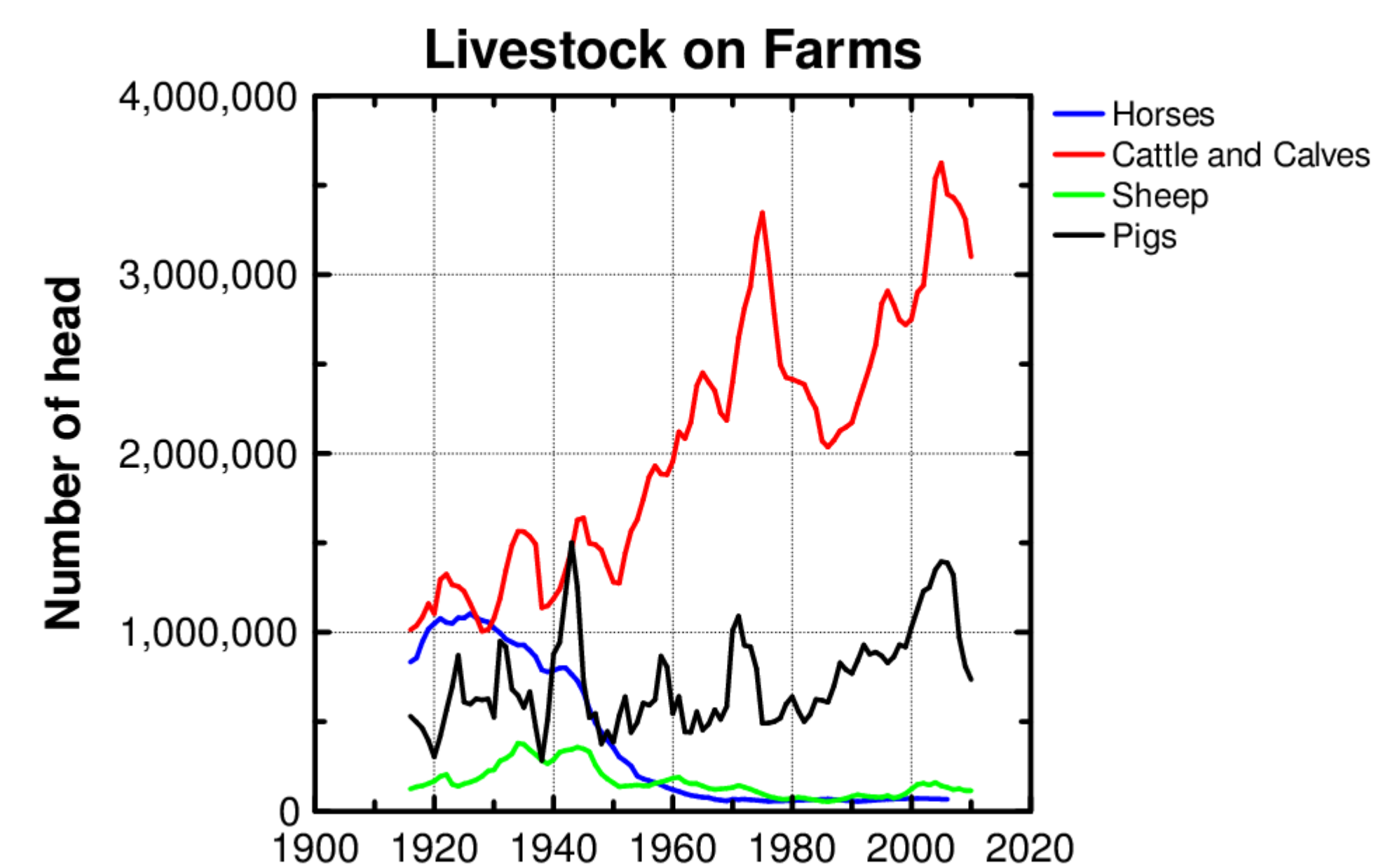
## Introduction

- Saskatchewan has a total land area of 651,900 km<sup>2</sup>
- livestock raised in the province include cattle, pigs, poultry, sheep/goats, llama, ostrich, elk, deer, and bison
- total revenue from the Saskatchewan livestock sector was \$1.6 billion in 2010
- changing industry economics and advances in scientific, technical, and engineering knowledge and practices have affected the number and type of livestock produced over the past century

## Methods

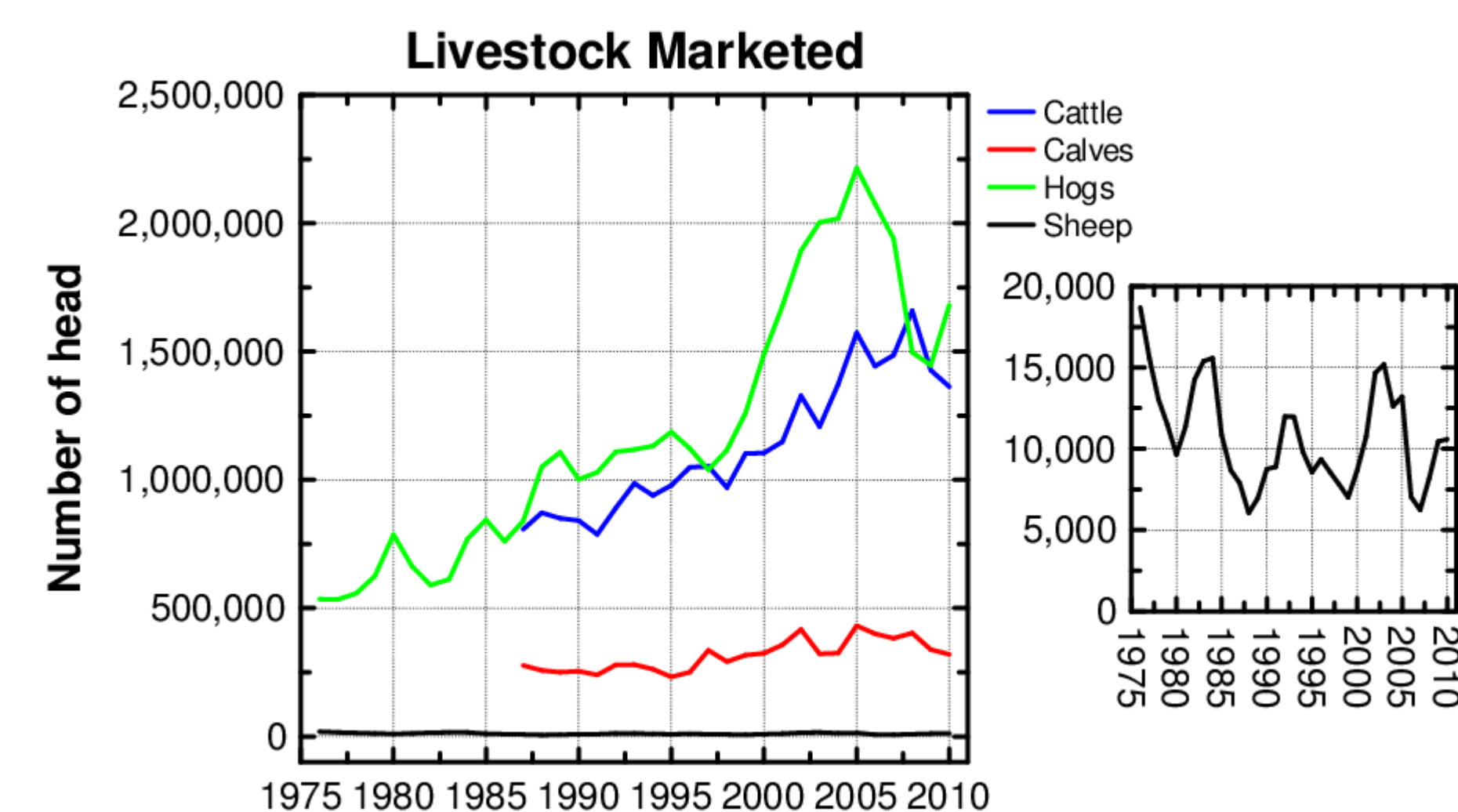
- crop statistics were obtained from the Government of Saskatchewan Agricultural Statistics online database: <http://www.agriculture.gov.sk.ca/Statistics>

## Results and Discussion

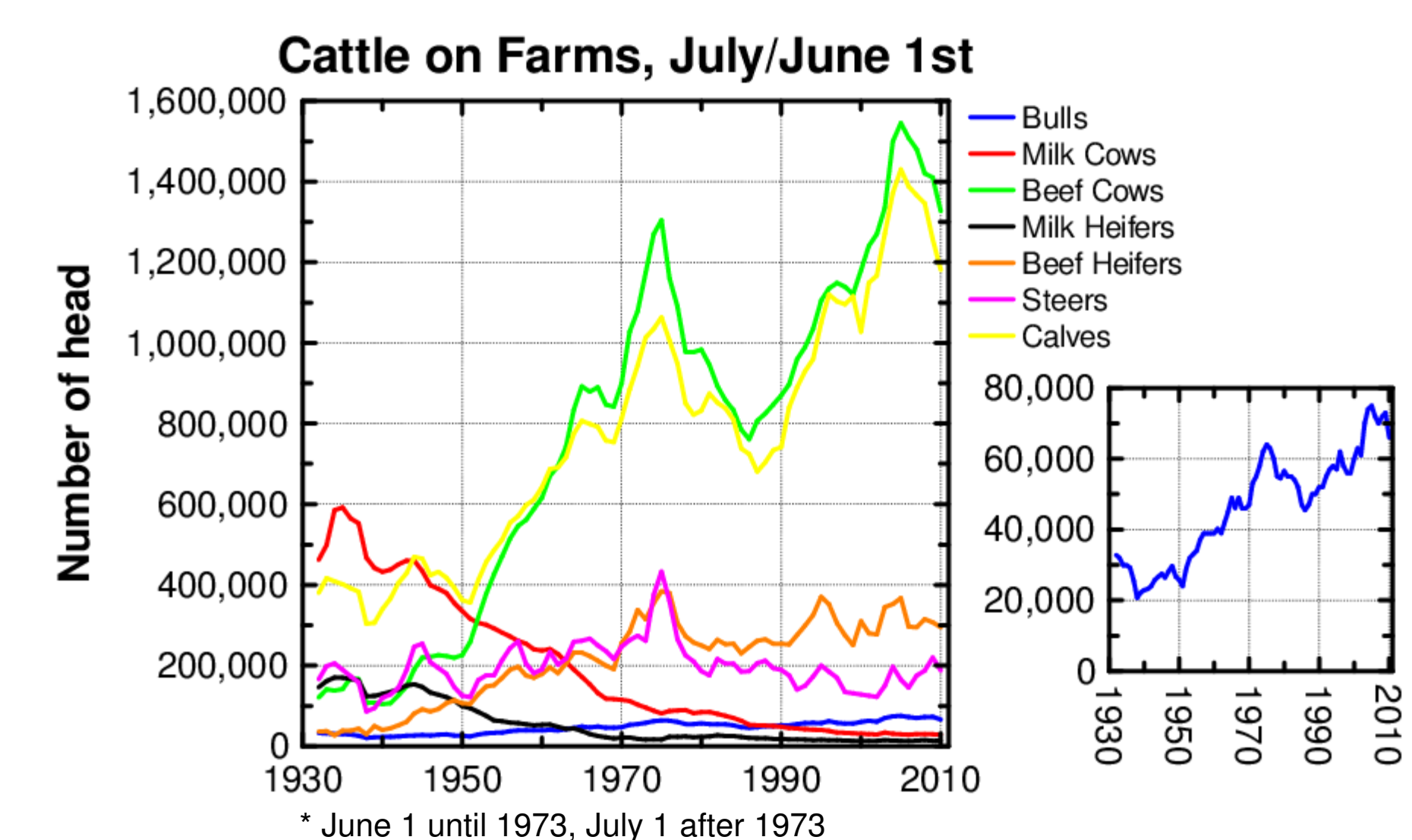


- numbers of cattle and calves on farms have increased steadily since the 1910s
- horse populations on farms peaked in the 1920s, declined until the late 1960s, and have remained approximately stable since this period
- numbers of pigs on farms have been variable but largely unchanged over the period of record, despite a continuing increase during the 1980s through early 2000s, followed by a sharp, recent decline
- sheep populations on farms peaked in the 1930s and 1940s, but have been relatively invariant over time

## Results and Discussion

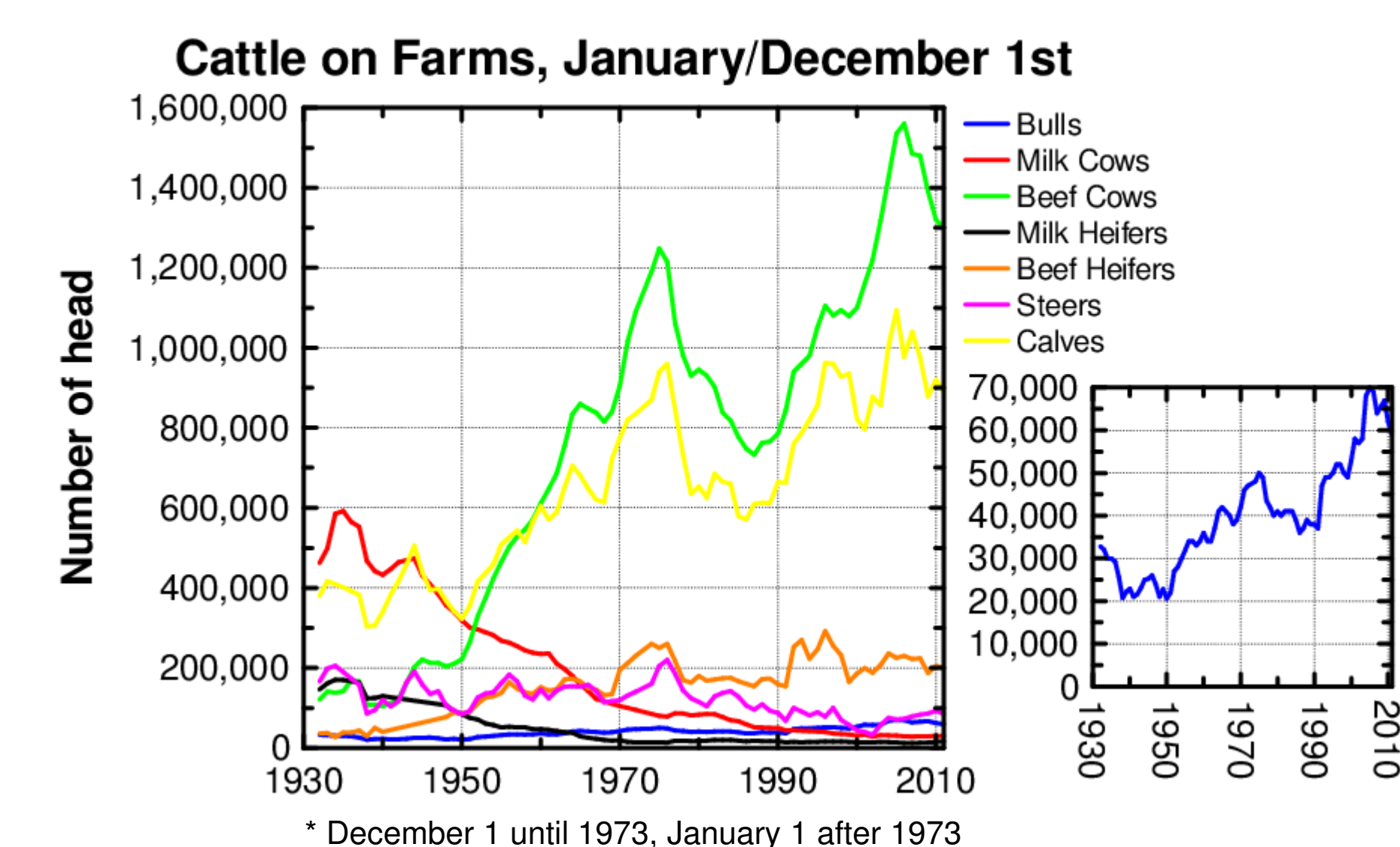


- numbers of marketed cattle have increased steadily since the mid-1980s
- marketed calves have increased slightly since the mid-1990s but are largely unchanged over the available record
- numbers of marketed hogs increased substantially from the mid-1970s up to 2005, but has since declined sharply
- marketed sheep numbers (also shown in the inset figure) have not changed significantly since the mid-1970s

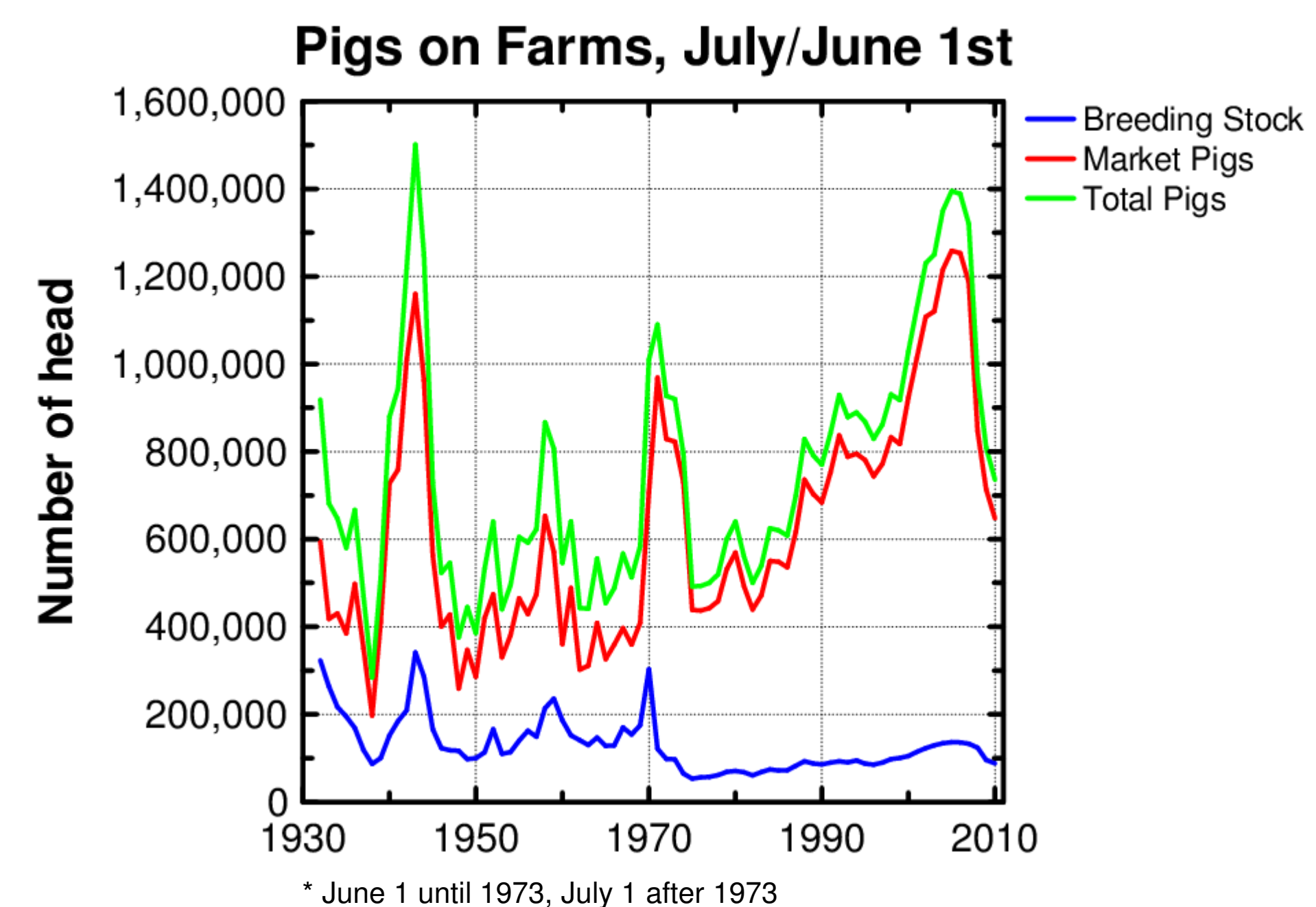


- numbers of beef cows and calves in summertime were approximately constant during the 1930s and 1940s, and then increased rapidly up to the mid-1970s, underwent a steep decline until the mid-1980s, then increased rapidly up to the mid-2000s, and have declined since this time
- milk cow and milk heifer numbers have been in decline since the 1930s
- there is no significant trend in the number of steers over the period of record
- numbers of bulls have increased steadily since the 1930s

## Results and Discussion

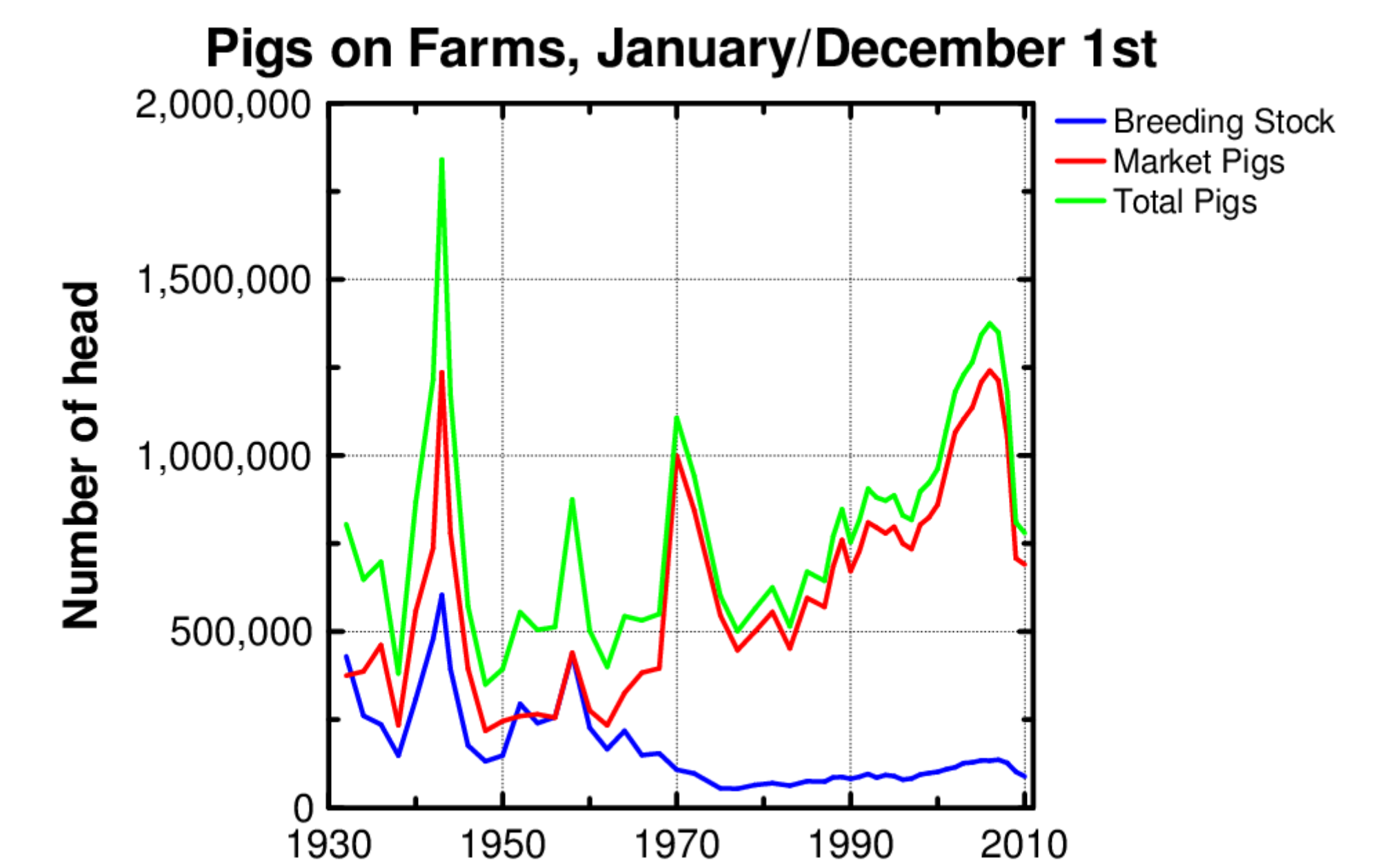


- numbers of beef cows and calves in wintertime were approximately constant during the 1930s and 1940s, and then increased rapidly up to the mid-1970s, underwent a steep decline until the mid-1980s, then increased rapidly up to the mid-2000s, and have declined since this time
- milk cow and milk heifer numbers have been in decline since the 1930s
- there is no significant trend in the number of steers over the period of record
- numbers of bulls have increased steadily since the 1930s

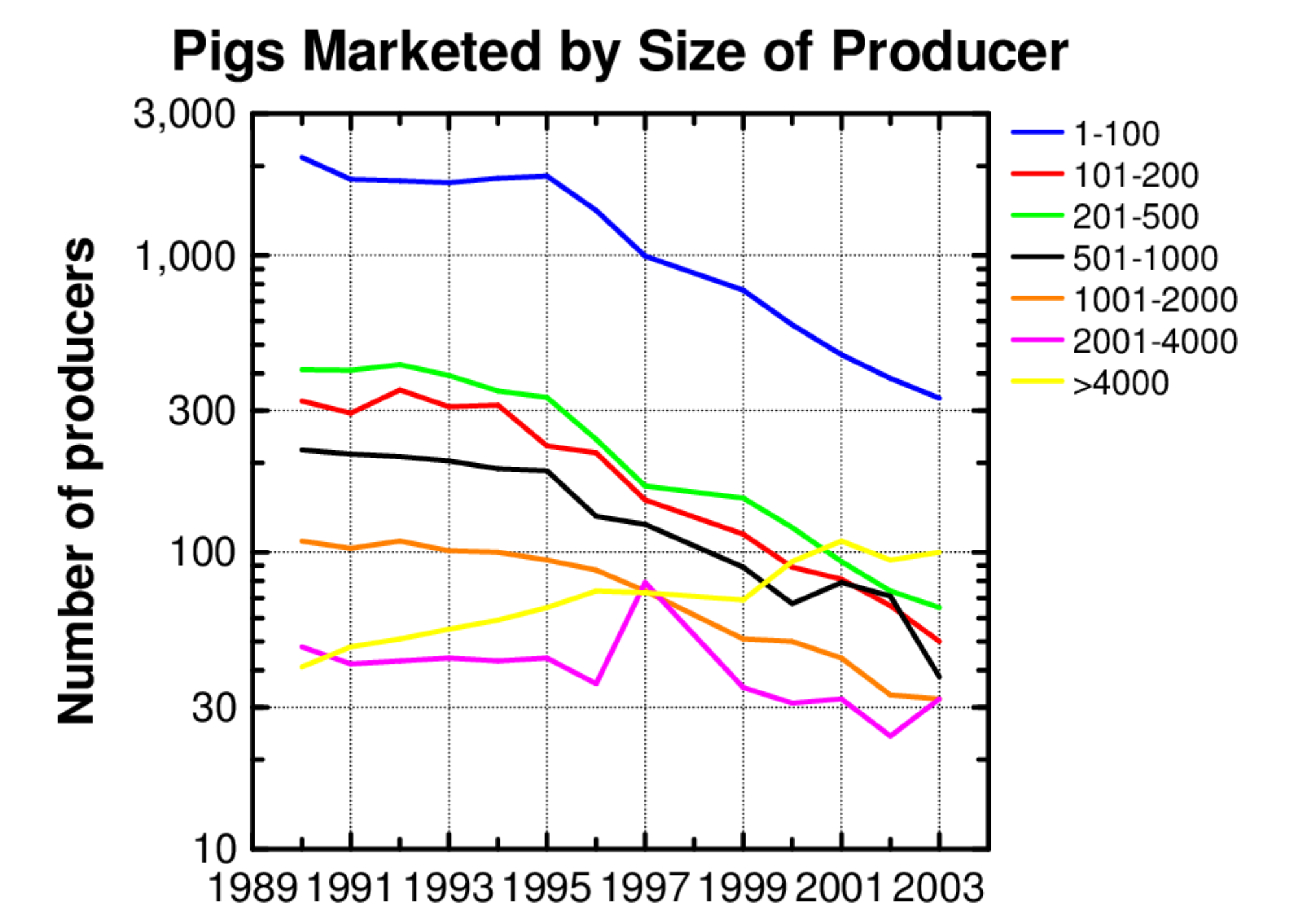


- pig populations on farms during summertime have been highly variable since the 1930s, with no overall time trend
- breeding stock populations between the mid-1970s and the present are generally lower than between the 1930s and early 1970s

## Results and Discussion



- pig populations on farms during wintertime have been highly variable since the 1930s, with no overall time trend
- breeding stock populations between the mid-1970s and the present are generally lower than between the 1930s and early 1970s



- substantial, and continuing, consolidation has been occurring in the pig industry since the late 1980s
- numbers of small- to mid-size producers in the province have been steadily declining, with a corresponding increase in the number of large (>4000 units) producers

# Time Trends for Livestock Production in Saskatchewan, Canada: 1905-2011



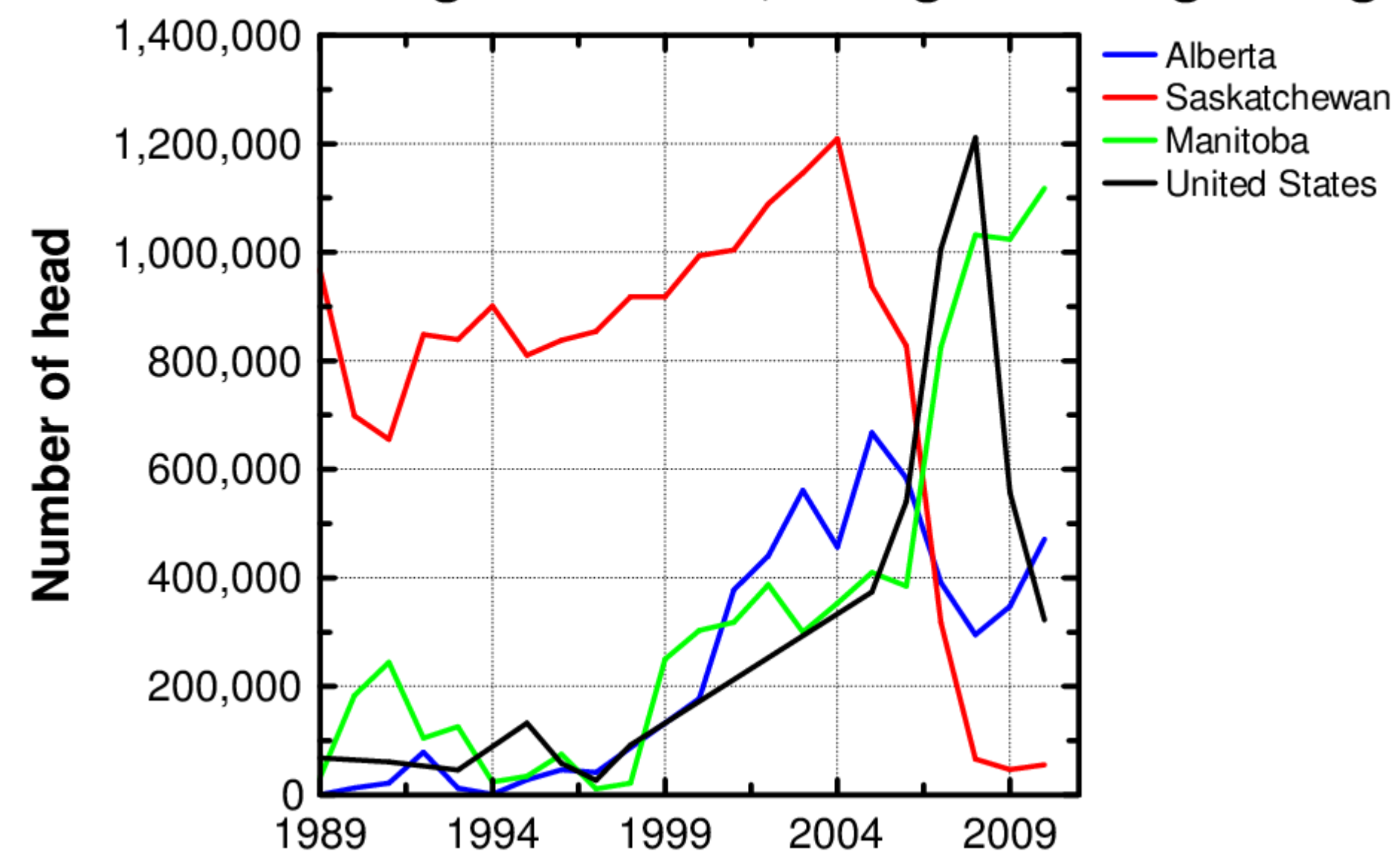
Sierra Rayne<sup>a</sup> and Kaya Forest<sup>b</sup>

<sup>a</sup> Chemologica Research, PO Box 74, 318 Rose Street, Mortlach, Saskatchewan, Canada, S0H 3E0; e-mail: rayne.sierra@gmail.com

<sup>b</sup> Department of Environmental Engineering, Saskatchewan Institute of Applied Science and Technology, Palliser Campus, PO Box 1420, 600 6th Avenue NW, Moose Jaw, Saskatchewan, Canada, S6H 4R4; e-mail: kaya.forest@siast.sk.ca

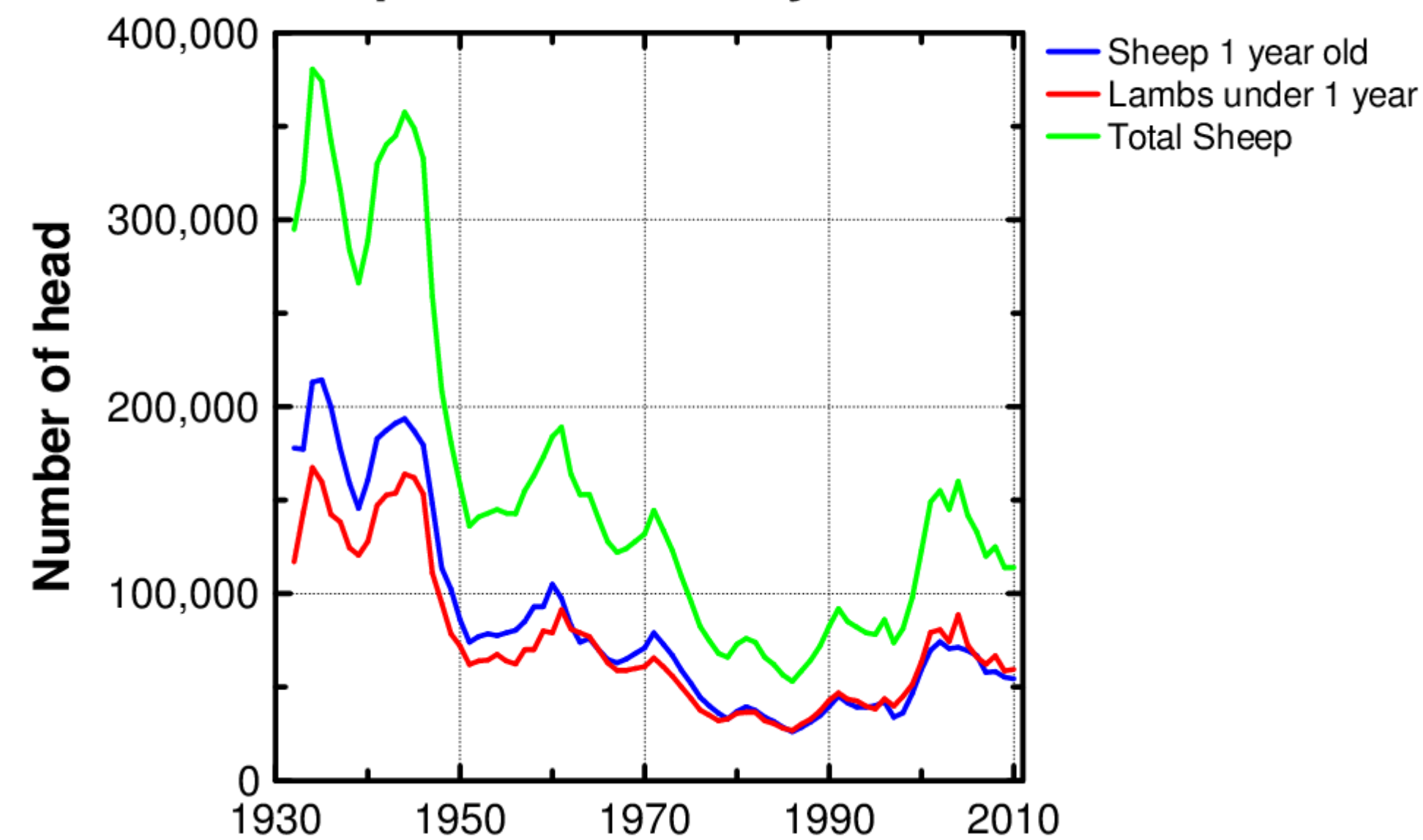
## Results and Discussion

### Destination of Pigs Marketed, Slaughter Weight Hogs



- increasing marketing of slaughter weight hogs to Manitoba has been occurring since the mid-1990s
- a similar trend exists for marketing to the United States, except there has been a very sharp decline during 2009 and 2010
- marketing to Alberta increased rapidly between the mid-1990s and early 2000s, and has since stabilized with modest inter-annual variability
- numbers of pigs marketed within Saskatchewan increased between the late 1980s and 2004, and then dropped very rapidly between 2004 and 2008 to historic lows

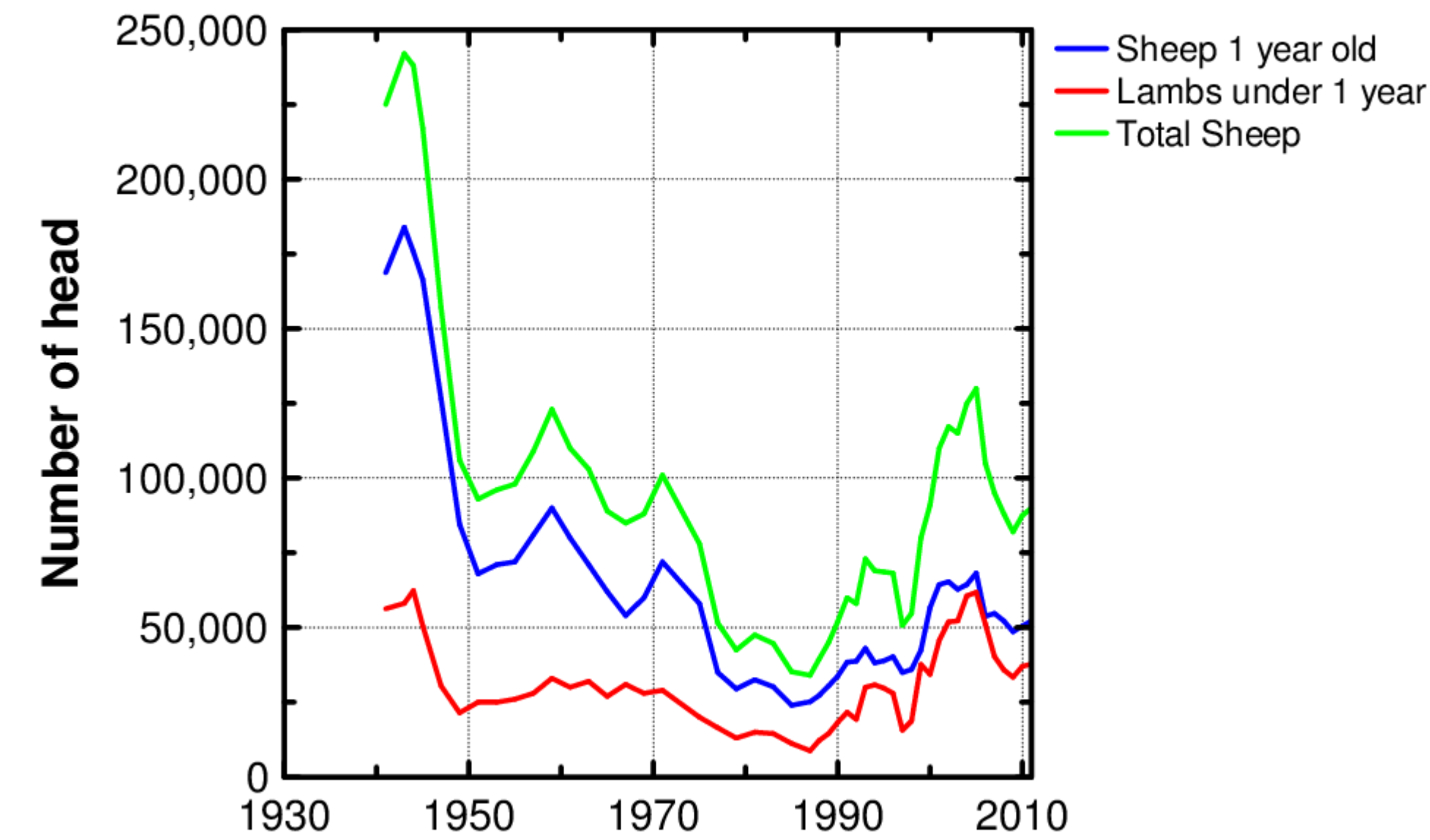
### Sheep on Farms, July/June 1st



- numbers of sheep on farms in summertime declined substantially following the peaks of the 1930s and 1940s, and has since stabilized with significant periodic variability

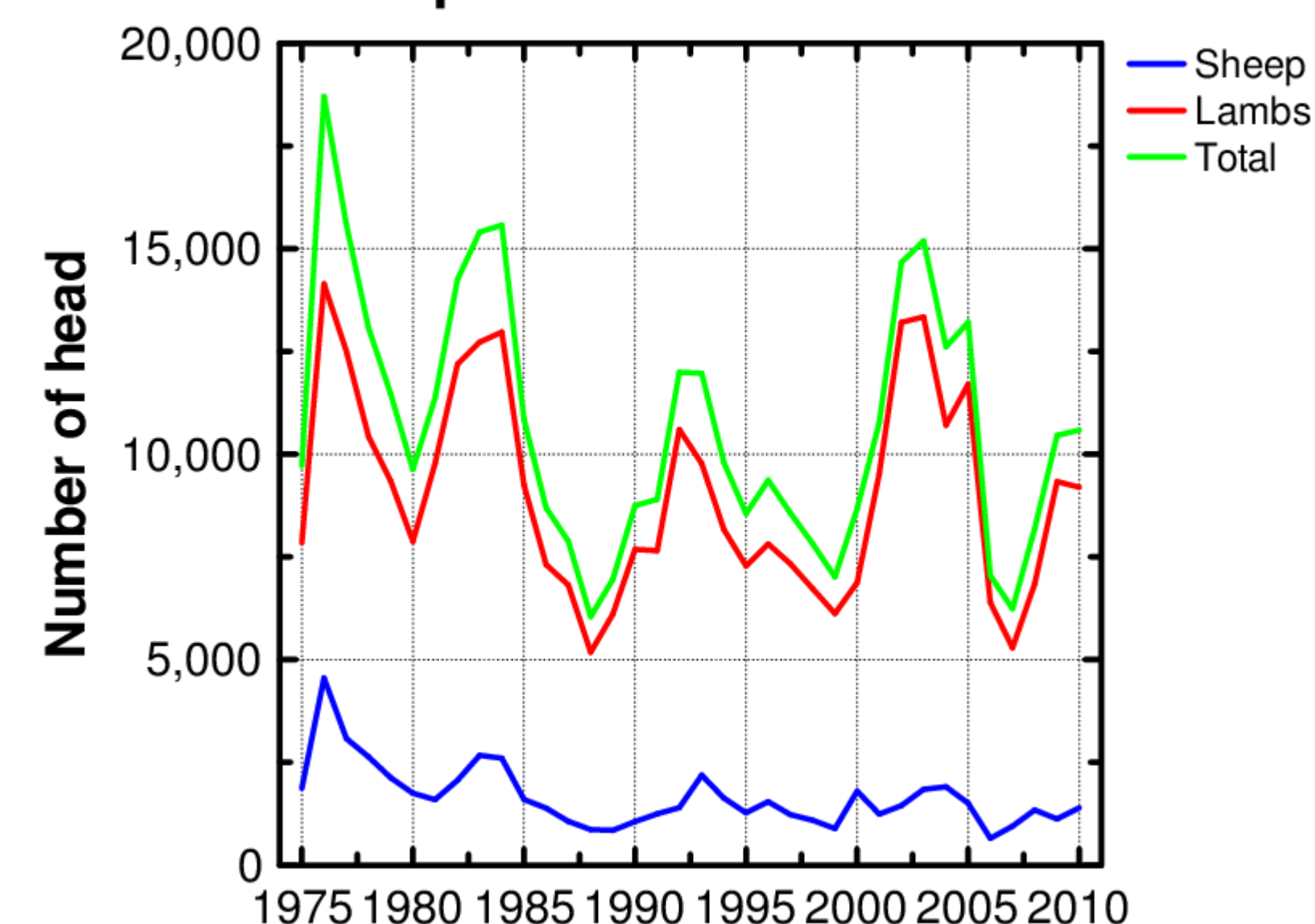
## Results and Discussion

### Sheep on Farms, January/December 1st



- numbers of sheep on farms in wintertime declined substantially following the peak of the 1940s, and has since stabilized with significant periodic variability

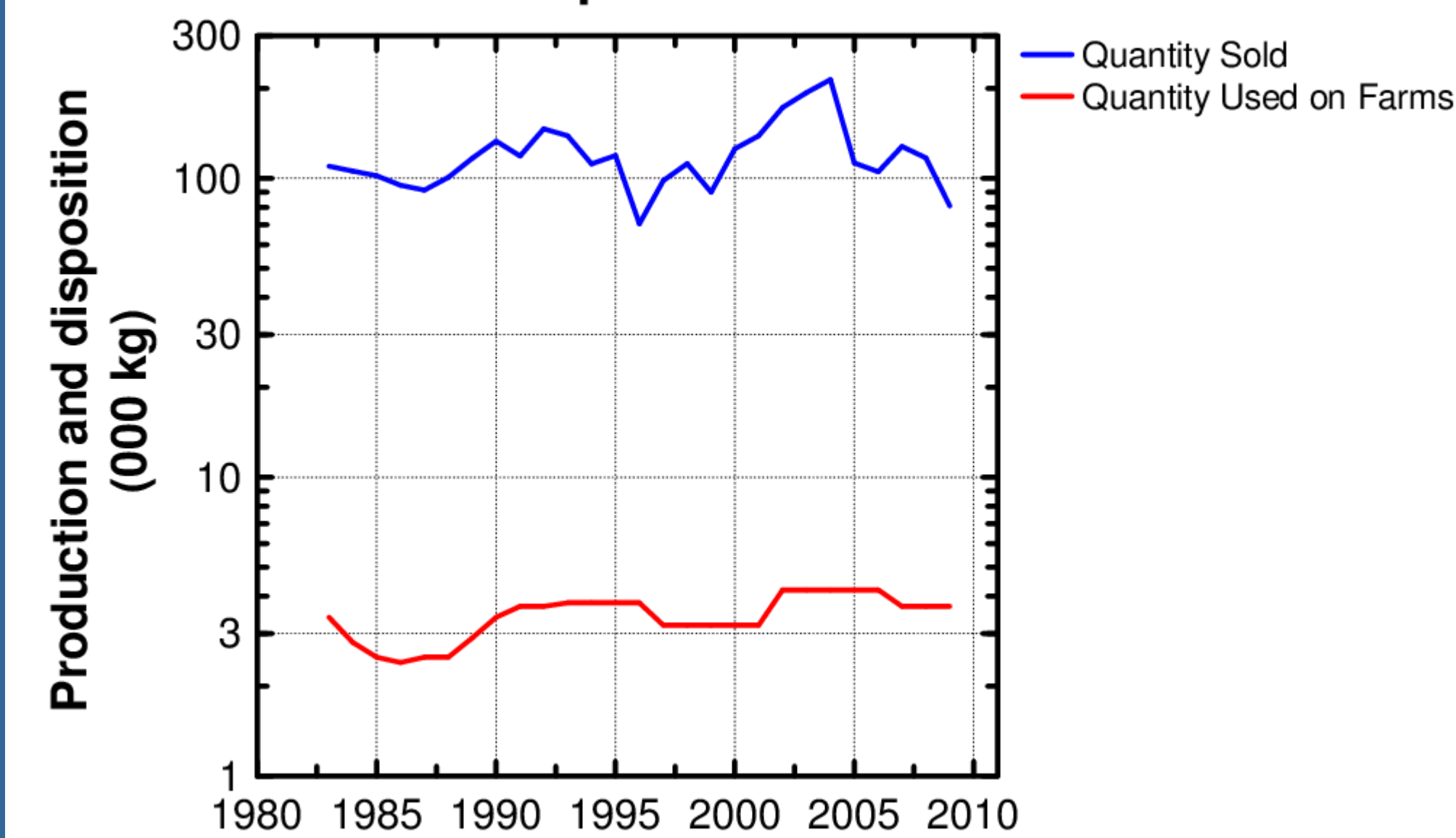
### Sheep and Lambs Marketed



- numbers of sheep and lambs marketed display no long-term temporal trends

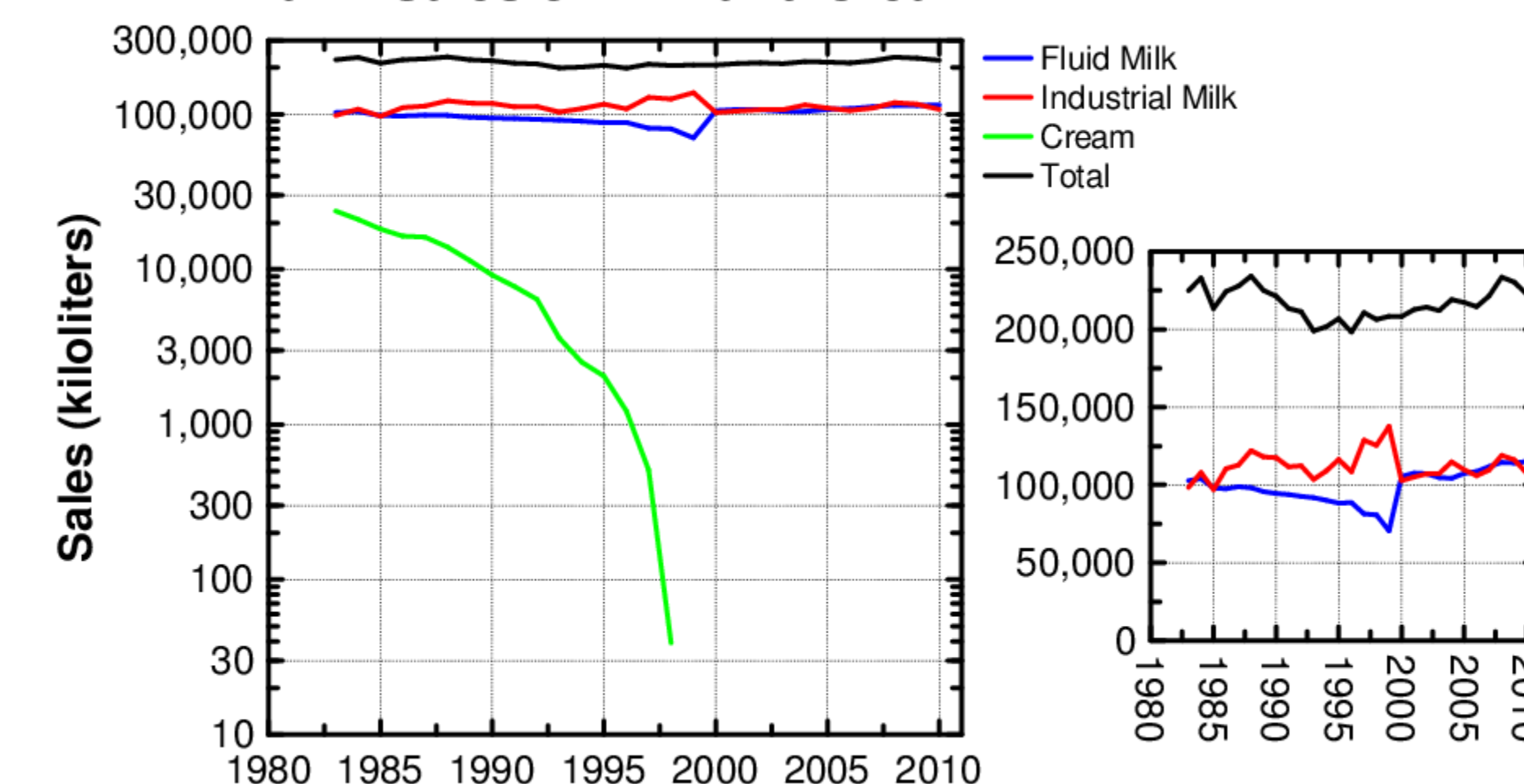
## Results and Discussion

### Production and Disposition of Shorn Wool

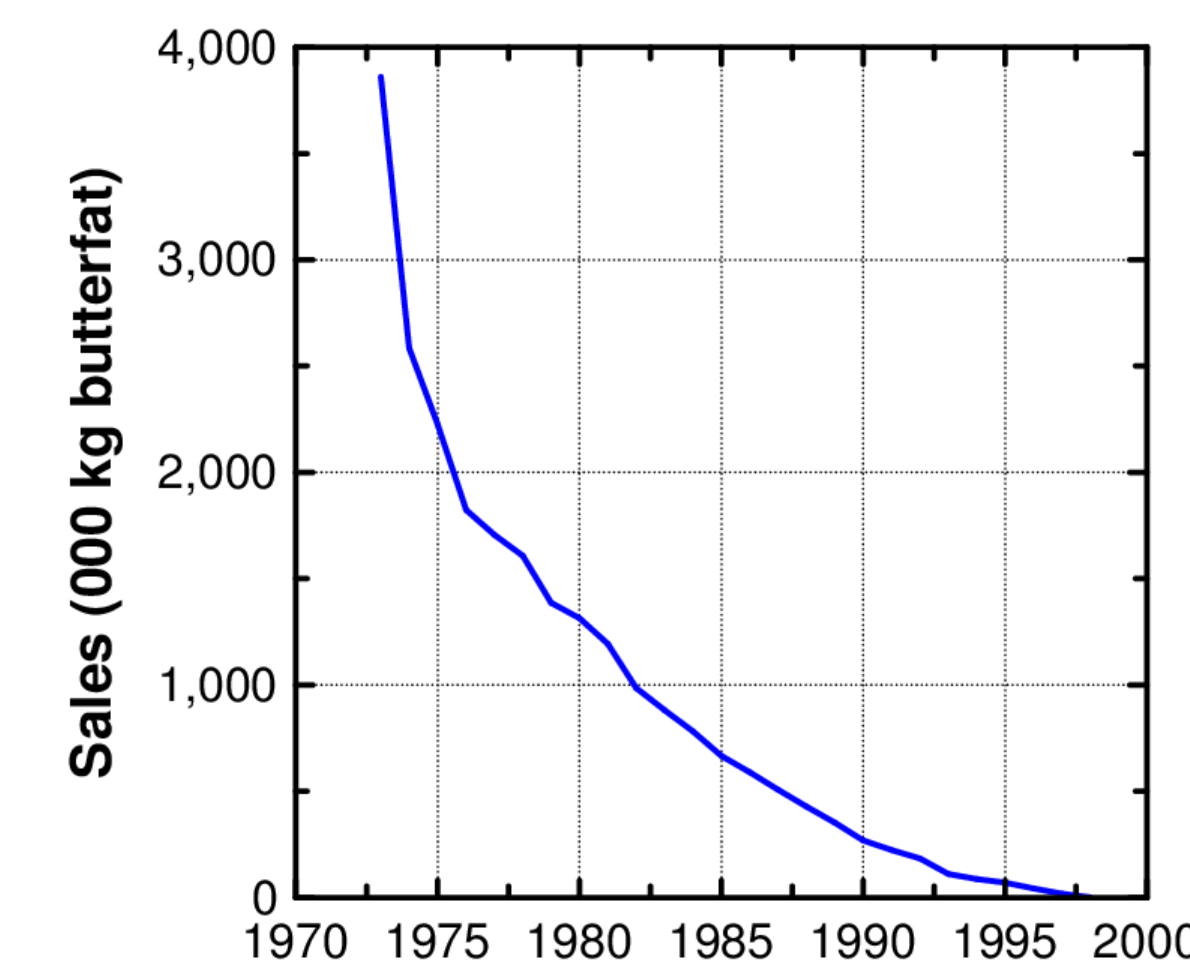


- the production and disposition of shorn wool has not changed significantly since the early 1980s

### Farm Sales of Milk and Cream



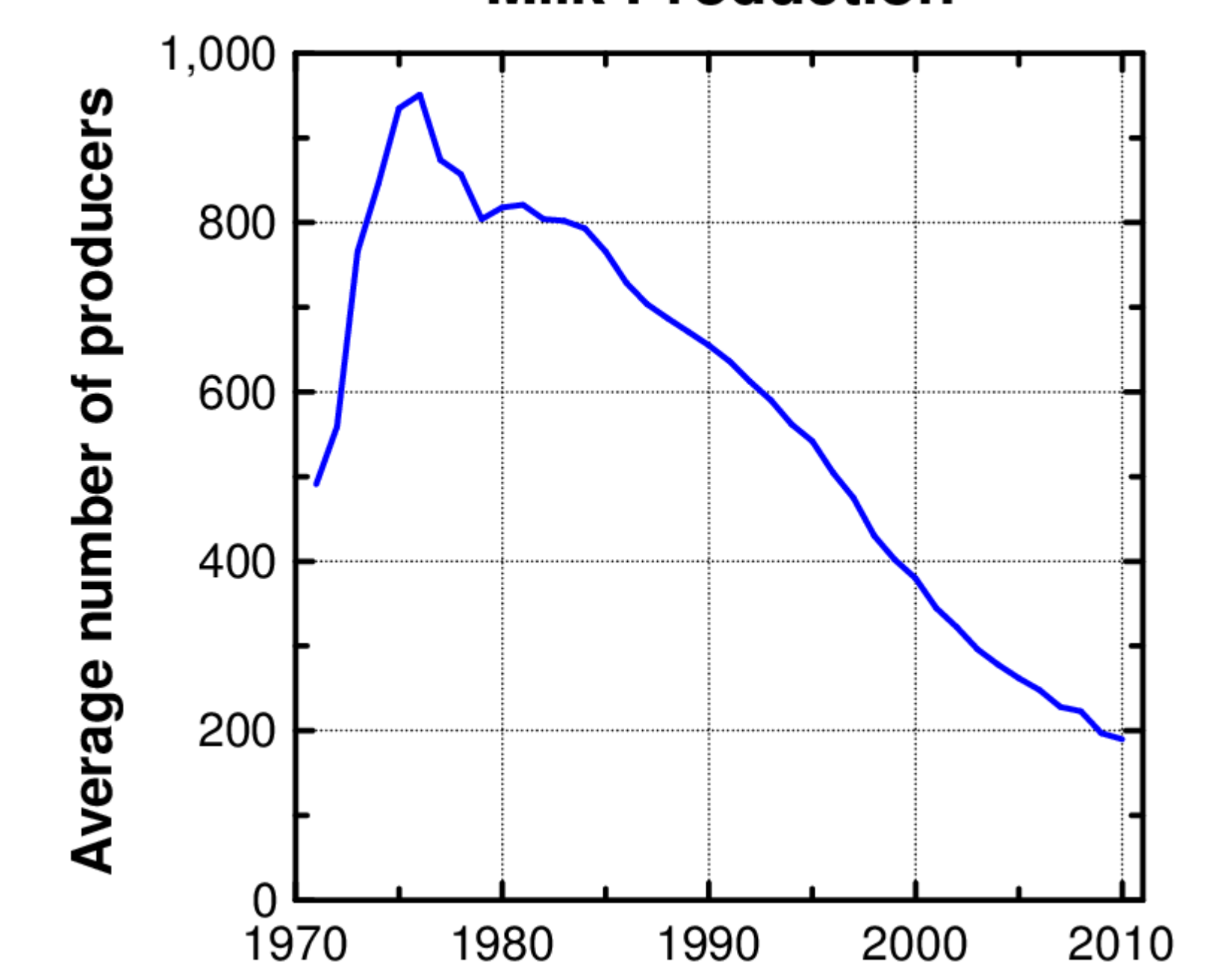
### Farm Cream Sales



- farm sales of fluid milk and industrial milk (as well as total sales) have not changed significantly since the early 1980s
- farms sales of cream declined rapidly and continuously from the early 1980s through the late 1990s

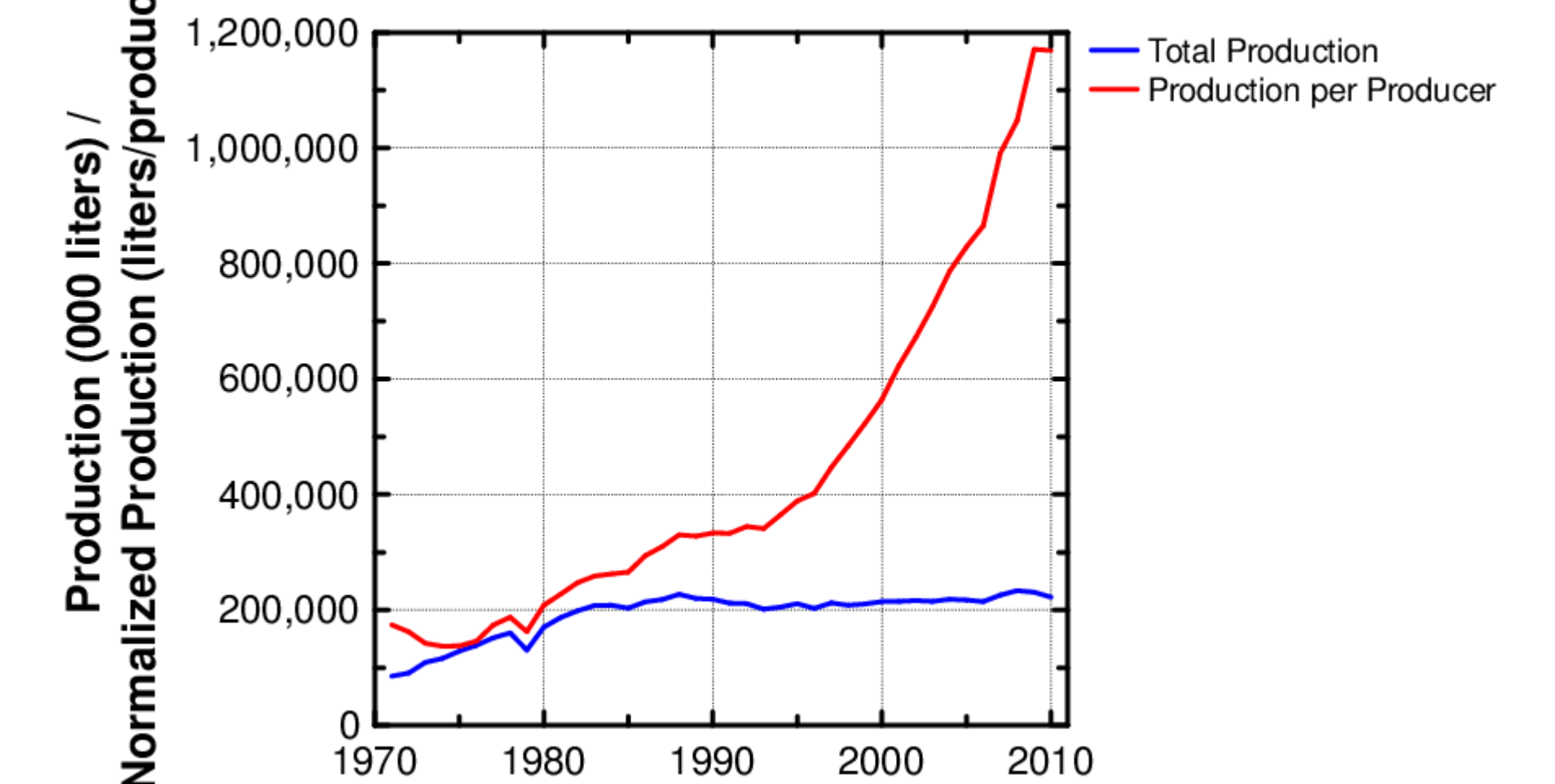
## Results and Discussion

### Milk Production



- the number of milk producers increased rapidly during the early 1970s, peaked in the mid-1970s, and has been in continuous decline since this time

### Milk Production



- milk production increased steadily during the 1970s and up to the late 1980s, and has remained approximately constant since this time
- industry consolidation starting in the mid-1970s has resulted in an exponential rate of growth for per-producer milk production

# Time Trends for Livestock Production in Saskatchewan, Canada: 1905-2011



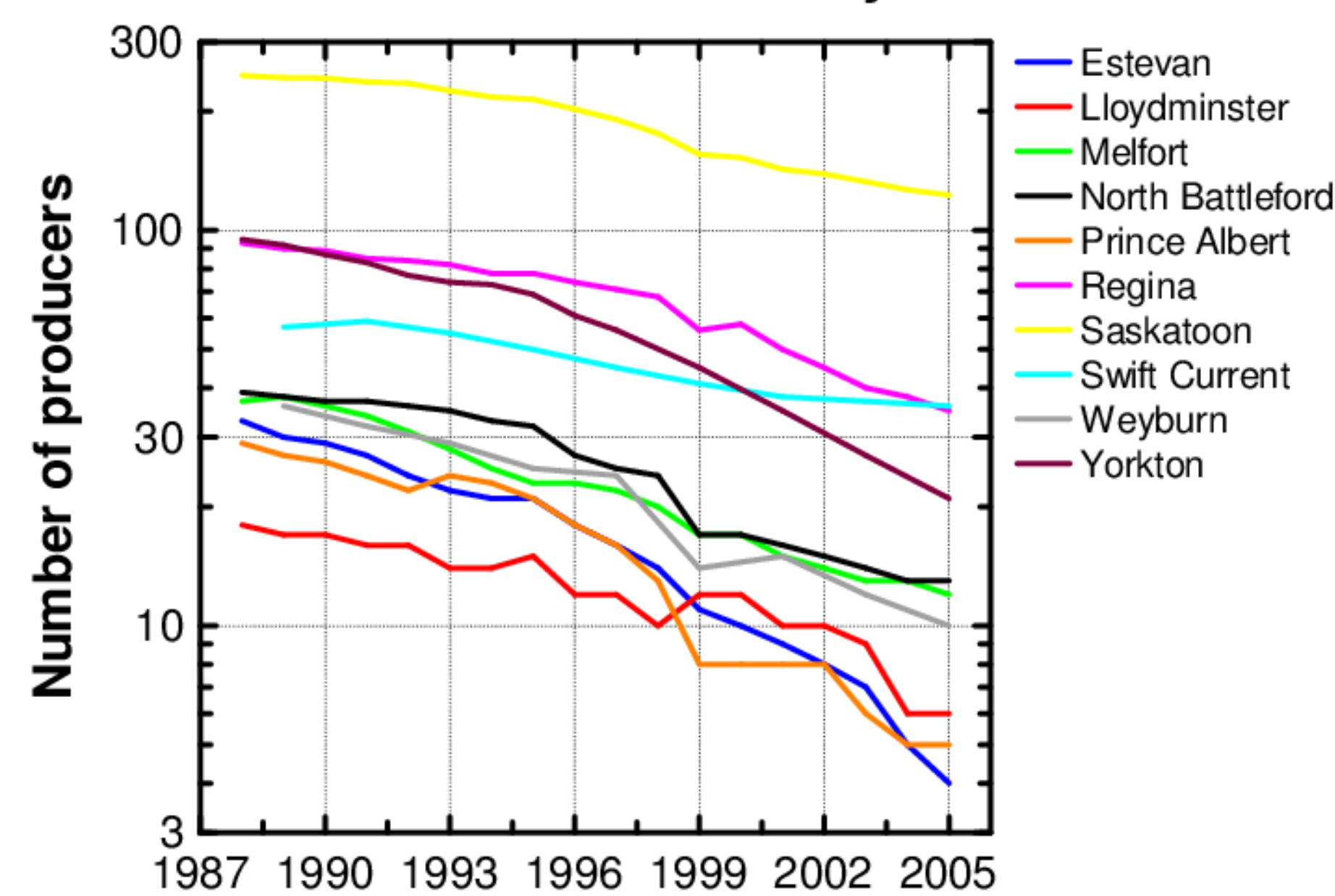
Sierra Rayne<sup>a</sup> and Kaya Forest<sup>b</sup>

<sup>a</sup> Chemologica Research, PO Box 74, 318 Rose Street, Mortlach, Saskatchewan, Canada, S0H 3E0; e-mail: rayne.sierra@gmail.com

<sup>b</sup> Department of Environmental Engineering, Saskatchewan Institute of Applied Science and Technology, Palliser Campus, PO Box 1420, 600 6th Avenue NW, Moose Jaw, Saskatchewan, Canada, S6H 4R4; e-mail: kaya.forest@siast.sk.ca

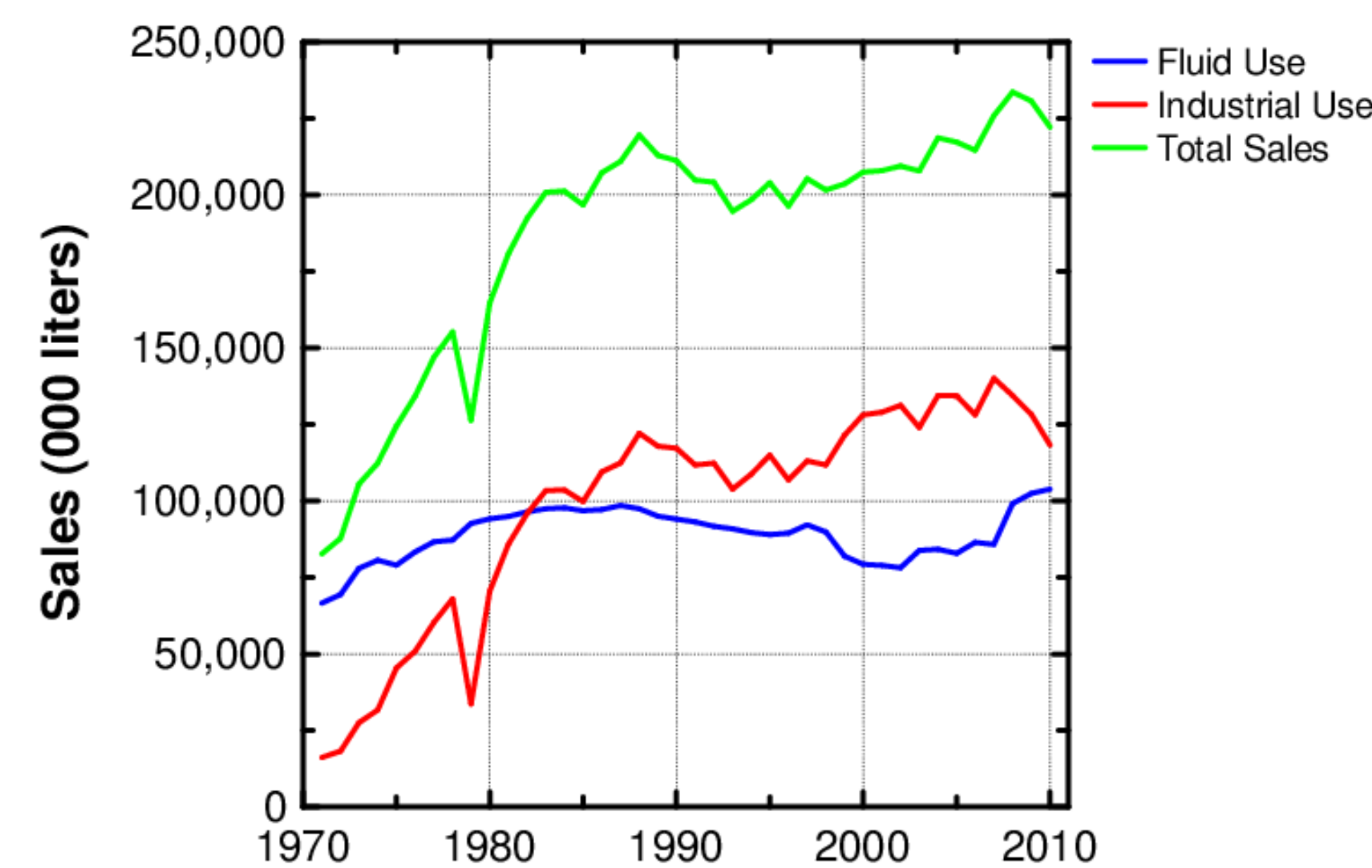
## Results and Discussion

### Saskatchewan Milk Producers by Quota Area



- with increasing industry consolidation, the number of producers in each quota area has steadily declined since the late 1980s

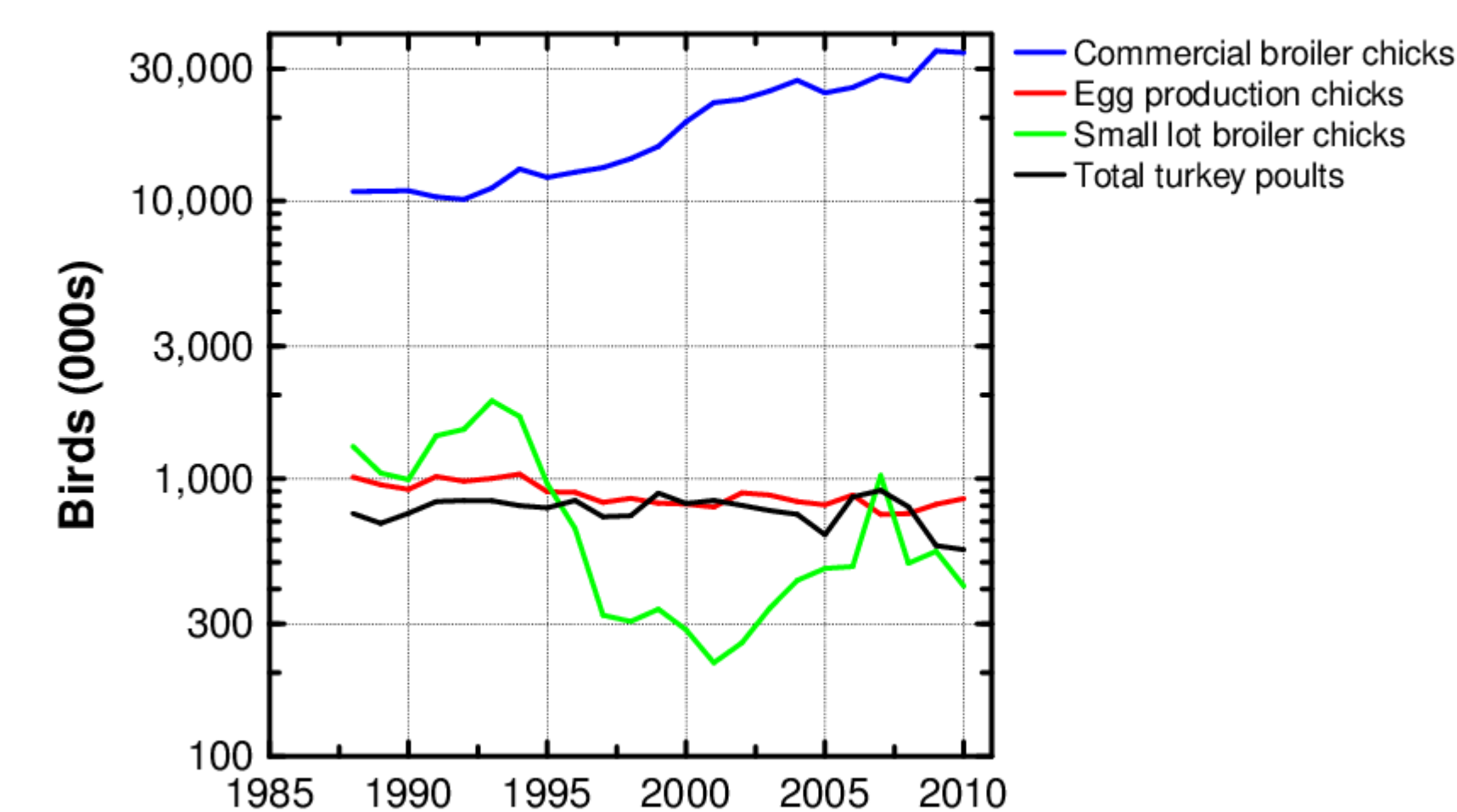
### Saskatchewan Milk Sales



- total milk sales and industrial use increased steadily between the early 1970s and the late 1980s, and has remained approximately constant since this time
- milk fluid use has remained approximately constant, with periodic variability, since the early 1970s

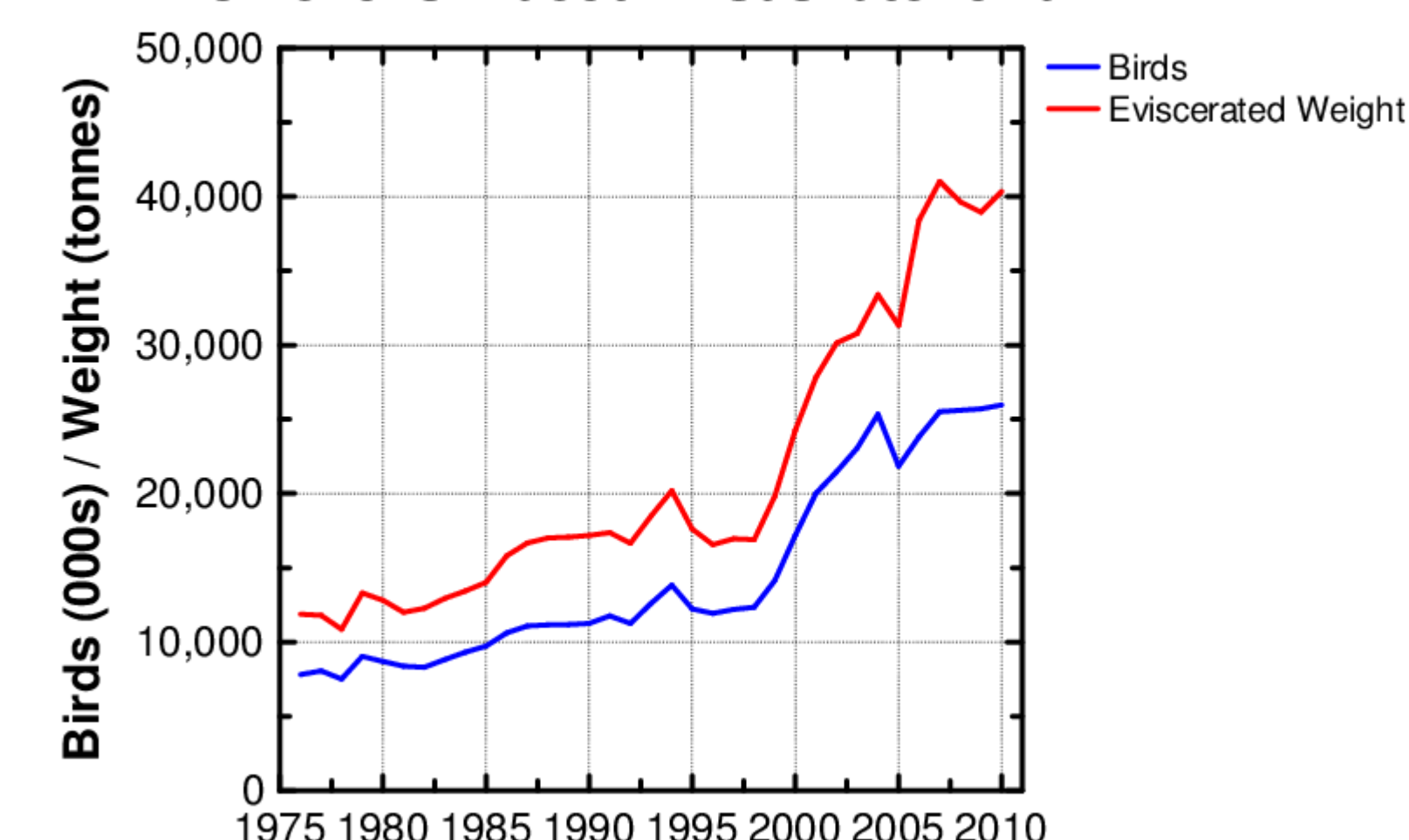
## Results and Discussion

### Chickens and Turkeys Placed in Saskatchewan



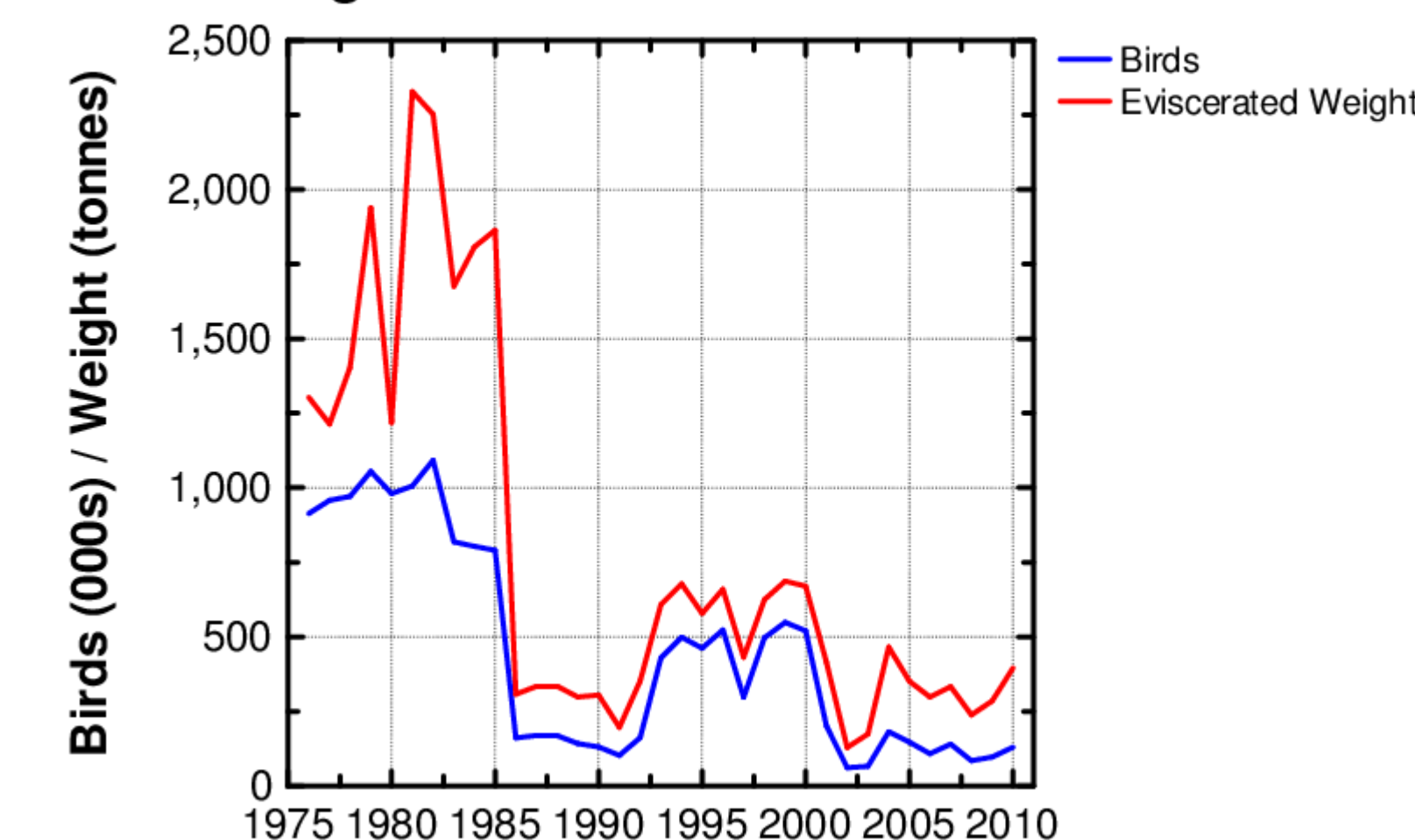
- numbers of commercial broiler chicks placed in Saskatchewan has increased steadily since the early 1990s
- egg production chicks and total turkey poults placed in Saskatchewan have not changed since the mid- to late 1980s
- numbers of small lot broiler chicks have exhibited periodic variability since the late 1980s, reaching a low in the early 2000s, with no clear longer term trend

### Chickens Placed in Saskatchewan



- total numbers of chickens placed in Saskatchewan and their weight has increased continuously since the mid-1970s

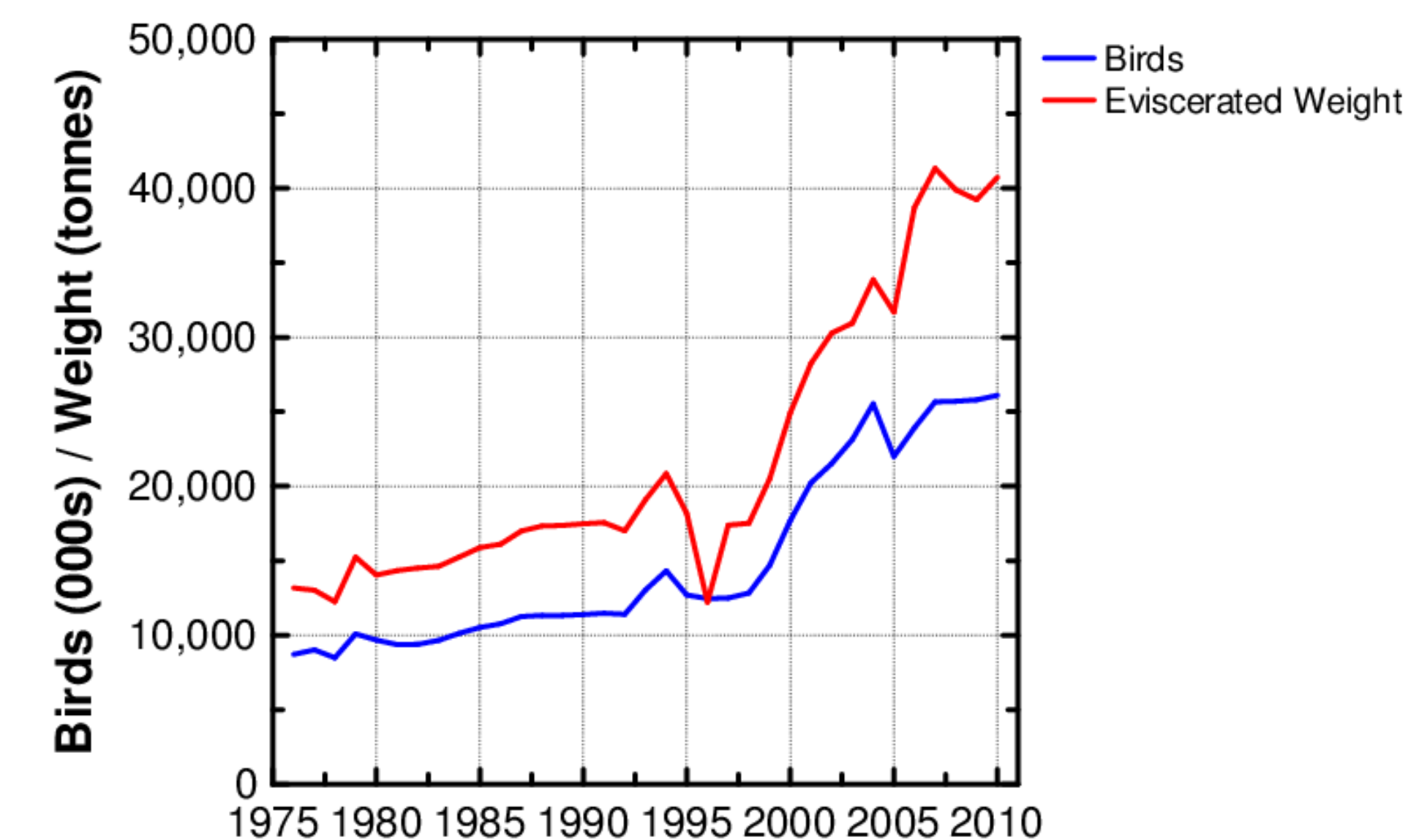
### Stewing Hens Placed in Saskatchewan



- following peak production from the mid-1970s through mid-1980s, numbers and weight of stewing hens placed in Saskatchewan dropped sharply and has remained approximately constant since this time

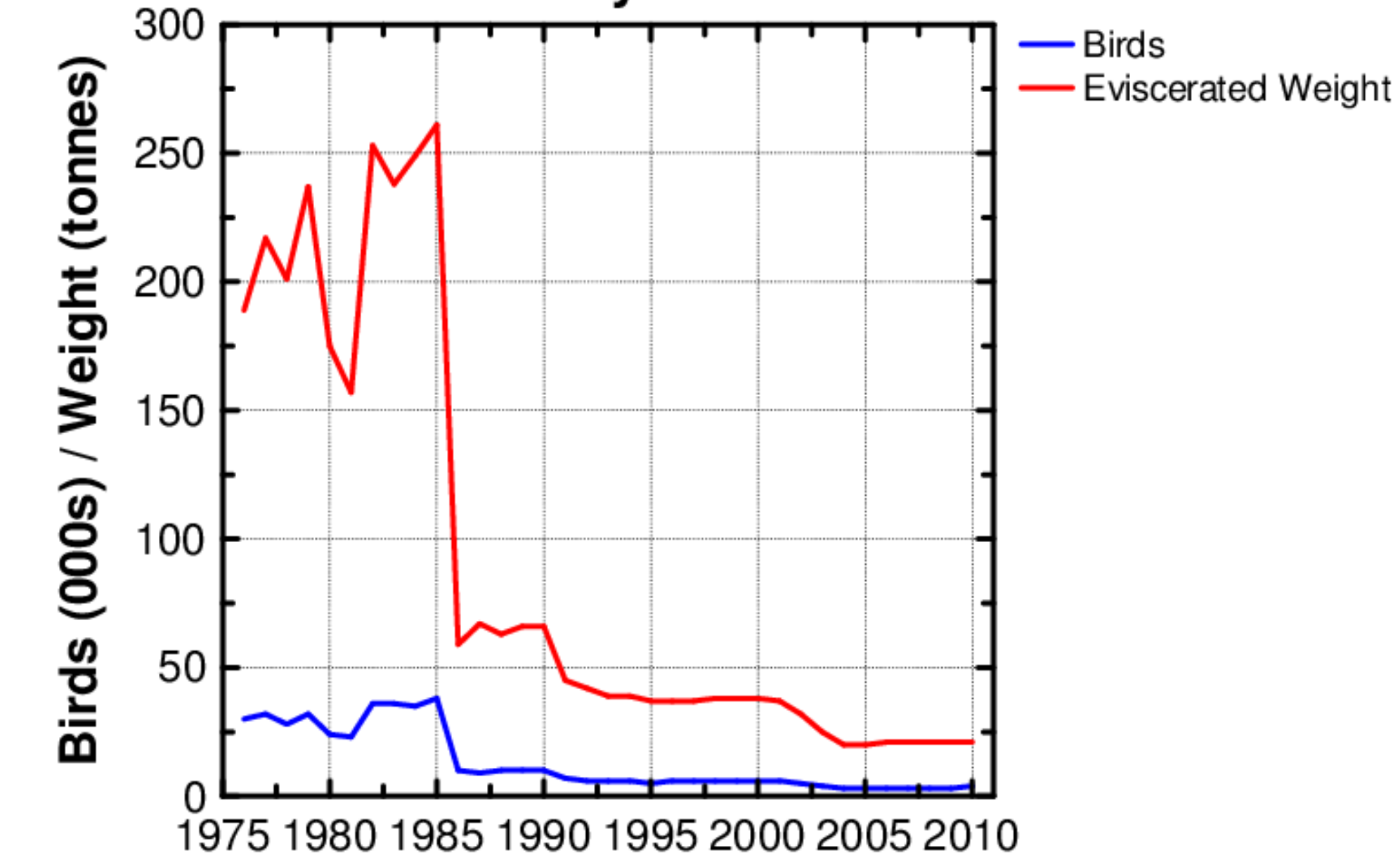
## Results and Discussion

### Total Hens and Chickens Placed in Saskatchewan



- numbers and weight of total hens and chickens placed in Saskatchewan has increased steadily since the mid-1970s

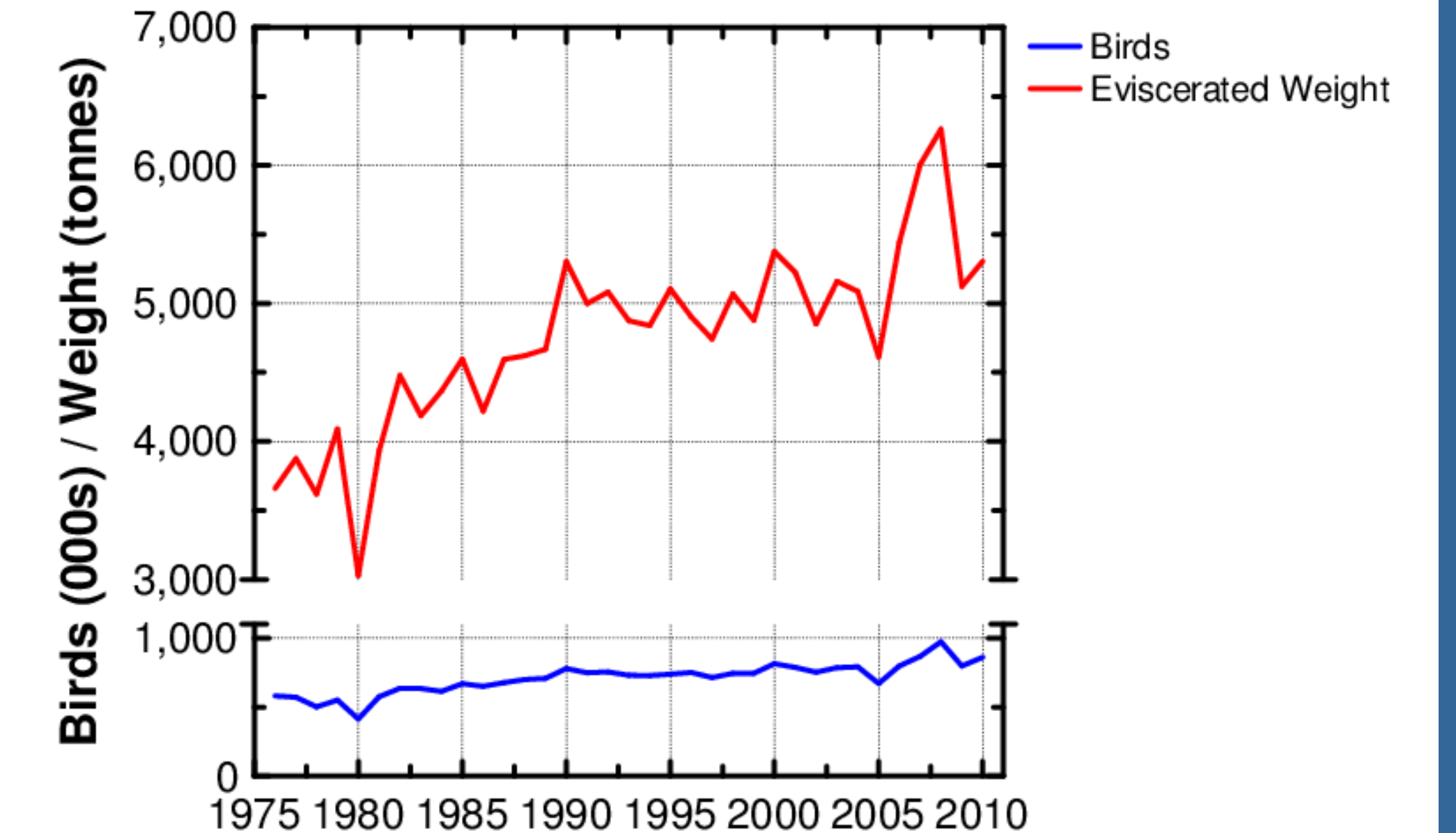
### Turkey Production, Disposition Consumed by Producers



- following peak production from the mid-1970s through mid-1980s, numbers and weight of turkeys consumed by producers dropped sharply and has declined slowly since this time

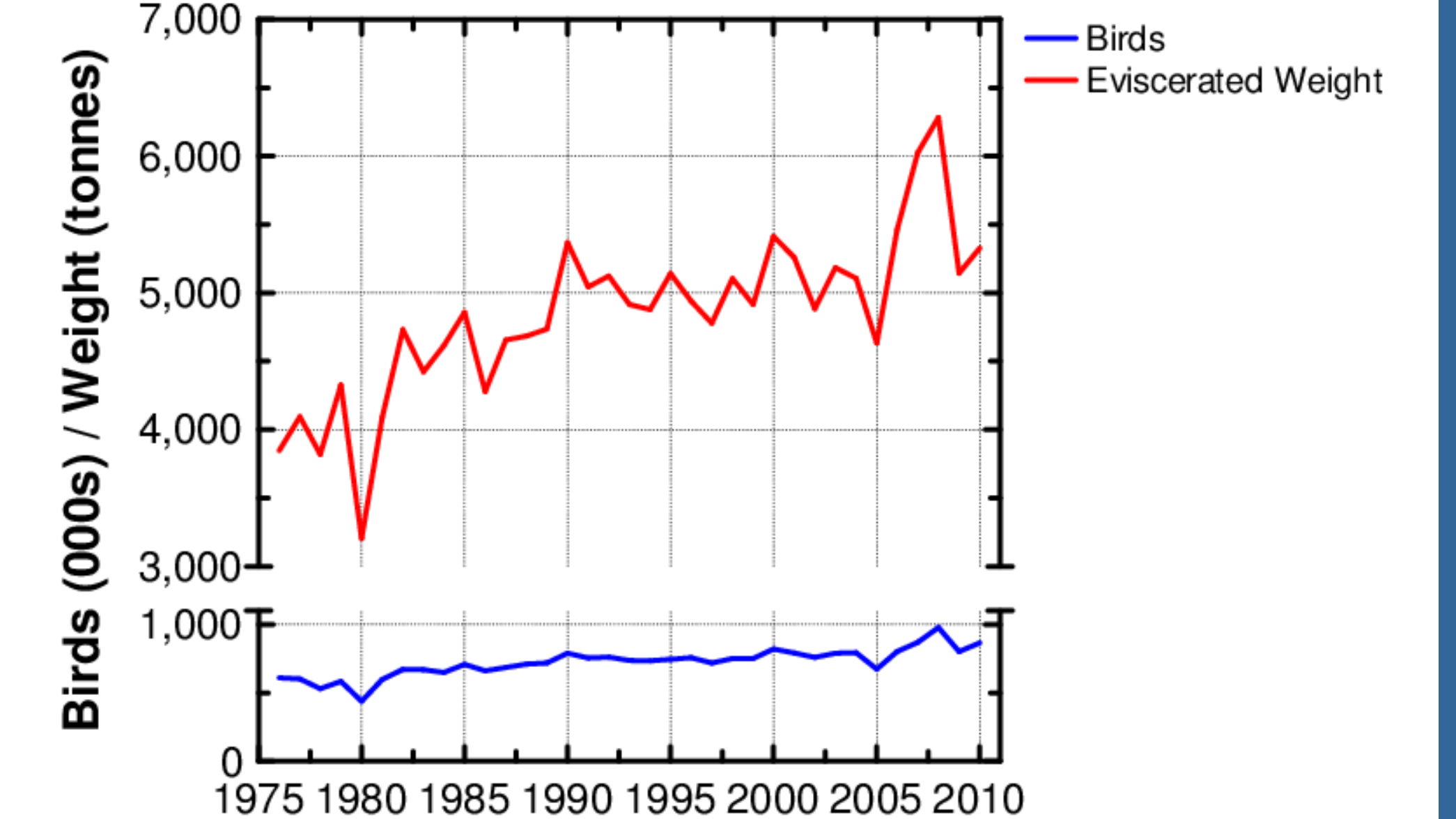
## Results and Discussion

### Turkey Production, Disposition Sold



- numbers and weight of turkeys sold by producers has increased steadily since the mid-1970s

### Turkey Production, Disposition Total Production



- numbers and weight of turkeys produced has increased steadily since the mid-1970s

# Time Trends for Livestock Production in Saskatchewan, Canada: 1905-2011



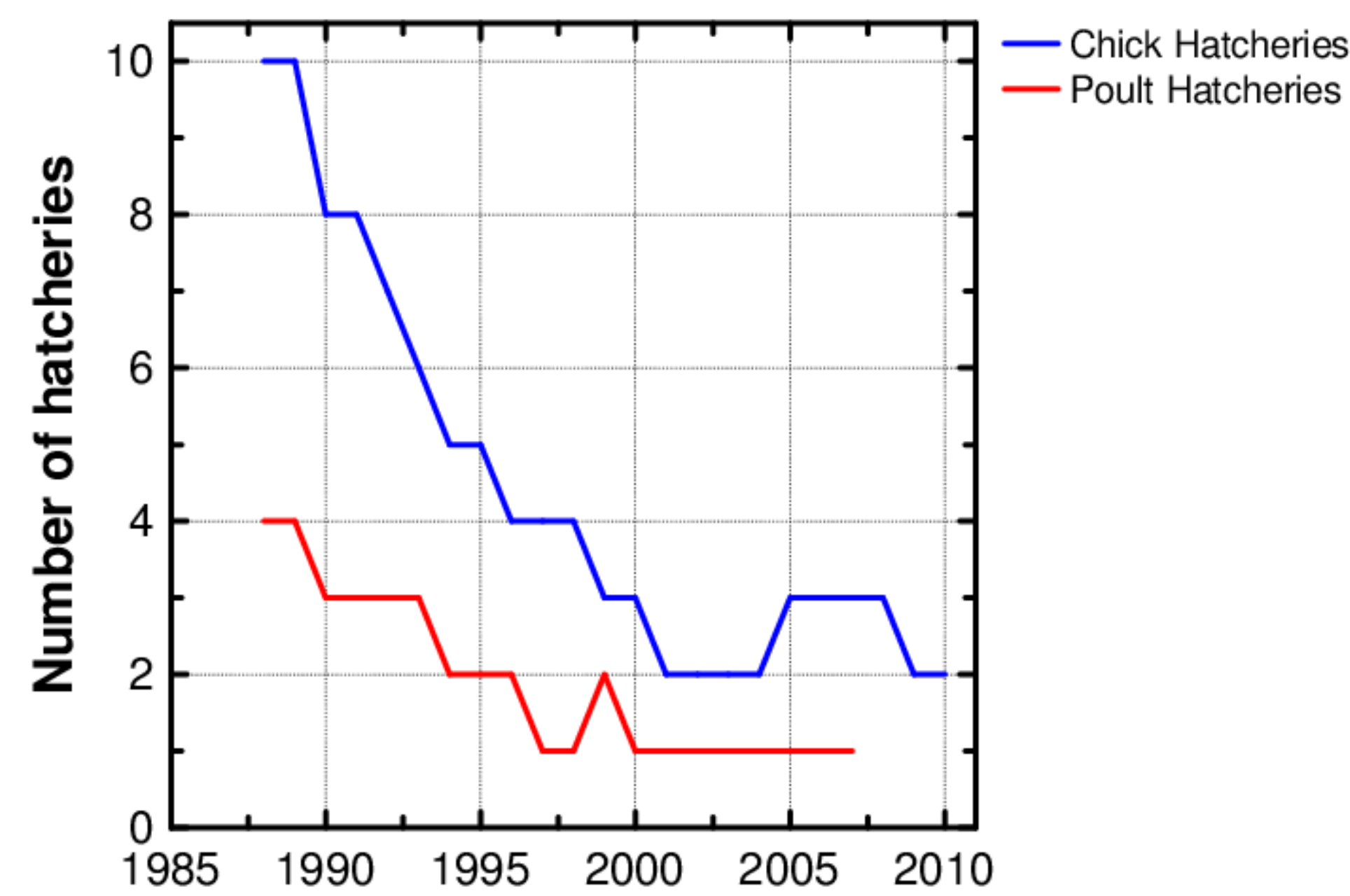
Sierra Rayne<sup>a</sup> and Kaya Forest<sup>b</sup>

<sup>a</sup> Chemologica Research, PO Box 74, 318 Rose Street, Mortlach, Saskatchewan, Canada, S0H 3E0; e-mail: rayne.sierra@gmail.com

<sup>b</sup> Department of Environmental Engineering, Saskatchewan Institute of Applied Science and Technology, Palliser Campus, PO Box 1420, 600 6th Avenue NW, Moose Jaw, Saskatchewan, Canada, S6H 4R4; e-mail: kaya.forest@siast.sk.ca

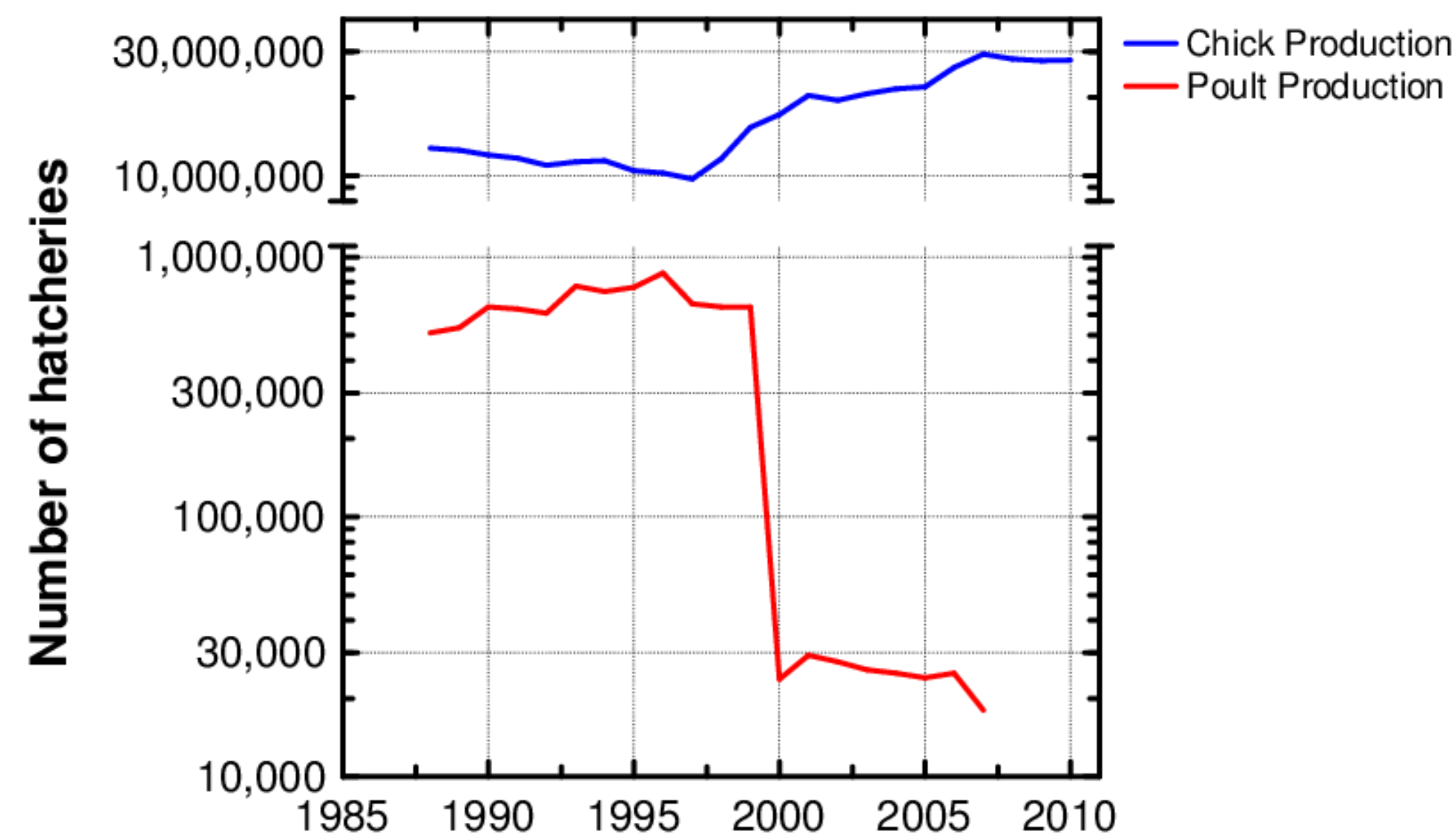
## Results and Discussion

Hatchery Production



- substantial consolidation has occurred in hatchery production, with a significant decline in both chick and poultry hatcheries during the late 1980s and 1990s, with numbers stabilized after 2000

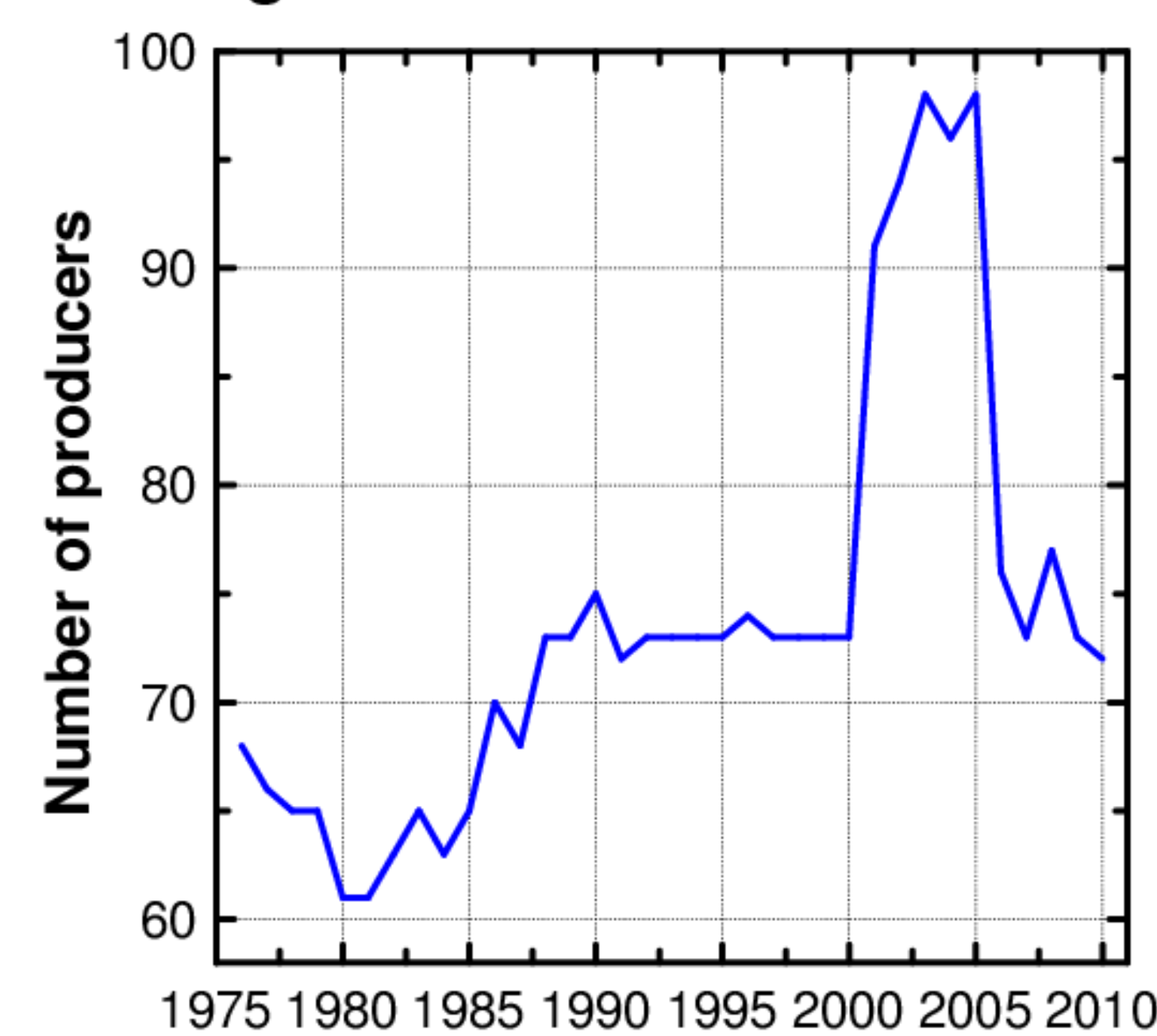
Hatchery Production in Registered Hatcheries



- chick production in registered hatcheries declined slightly from the late 1980s through to the late 1990s, and has since increased steadily
- poultry production increased from the late 1980s to the late 1990s, then dropped sharply and has stabilized at this historic low

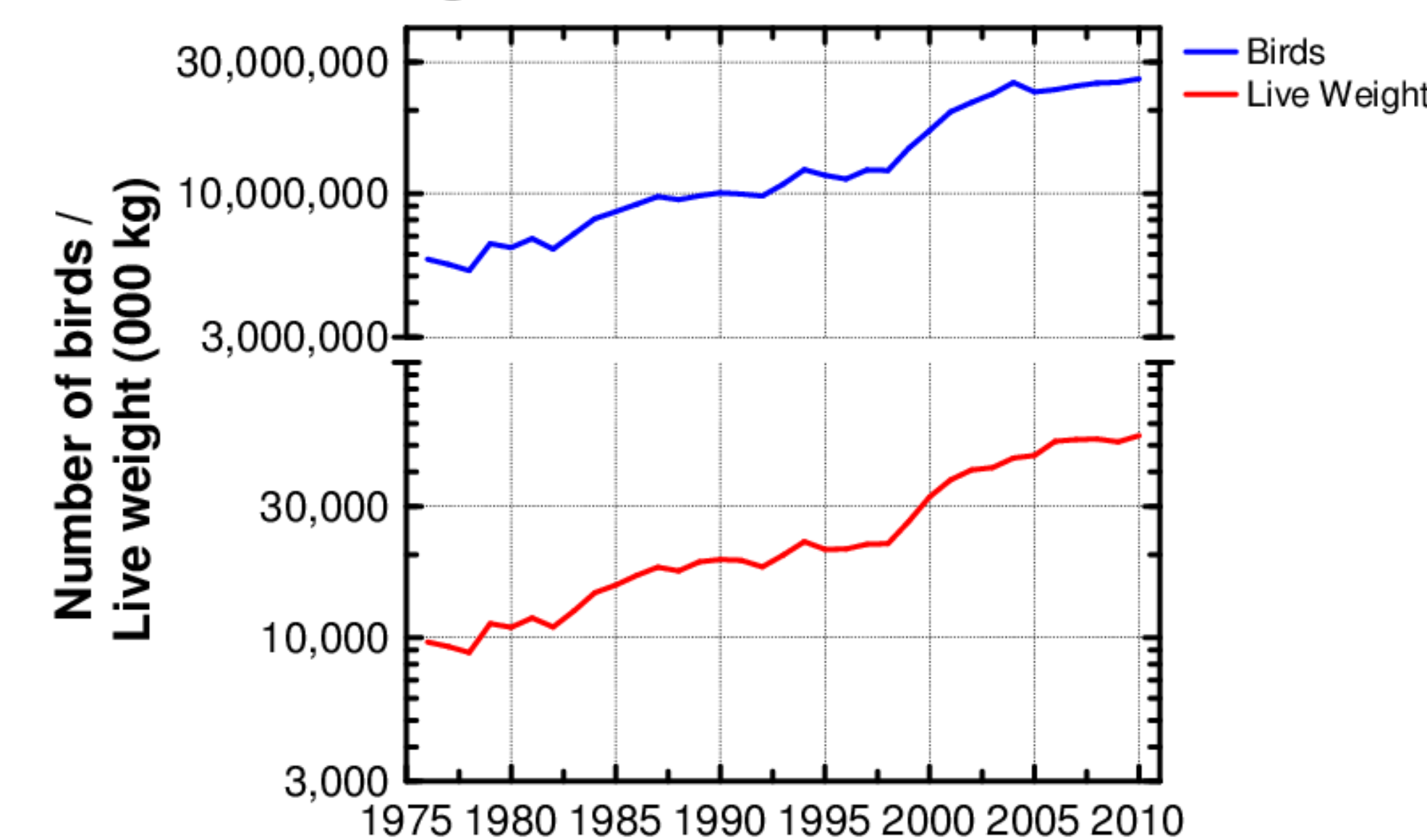
## Results and Discussion

Registered Chicken Production



- the number of chicken producers has been highly variable over time, declining slightly in the latter half of the 1970s, then increasing until 1990, remaining stable until 2000, spiking rapidly and subsequently declining during the early through mid-2000s and remaining stable at the pre-spike level over the past few years

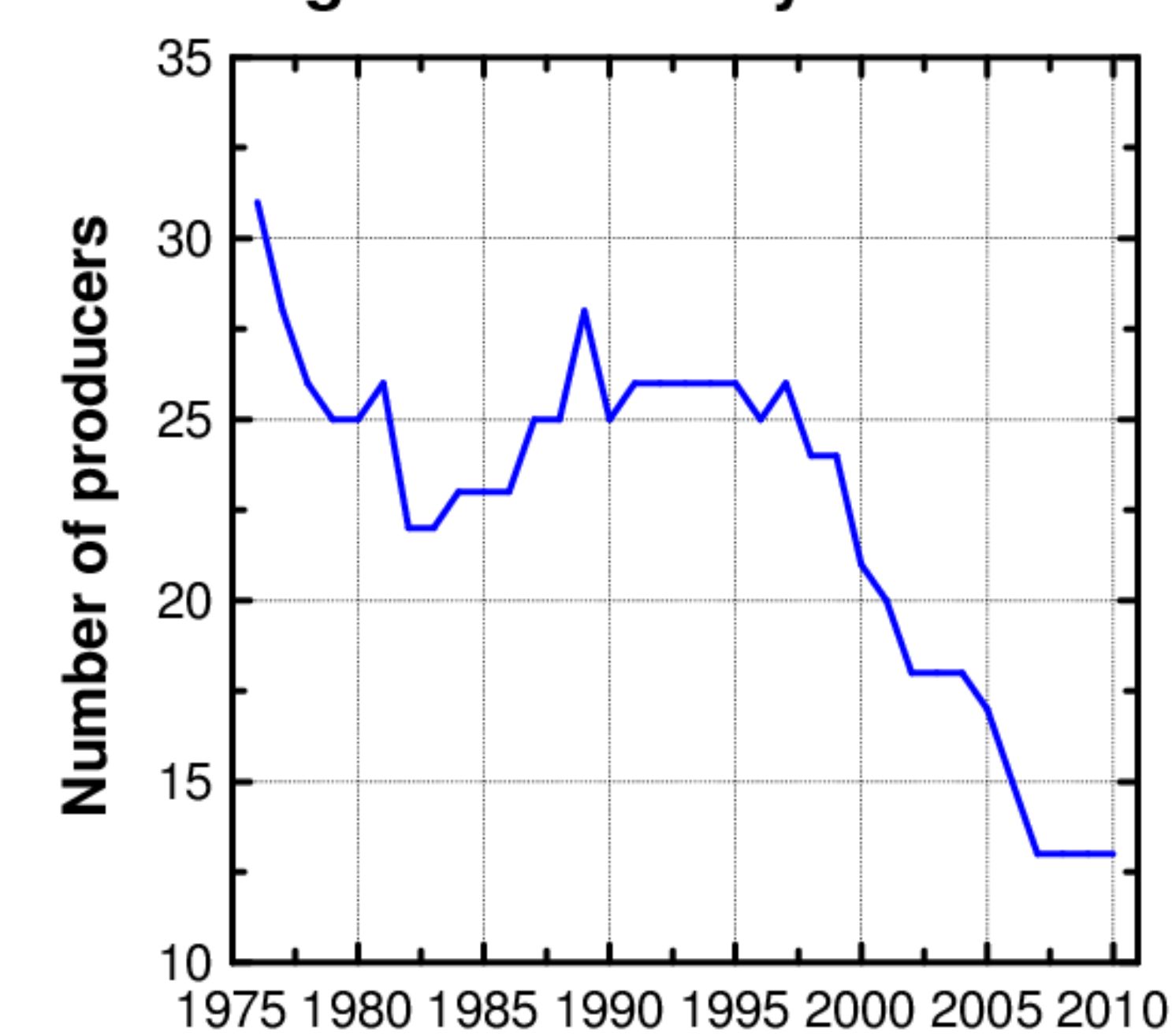
Registered Chicken Production



- both the number of chickens and their live weight have increased continuously since the mid-1970s

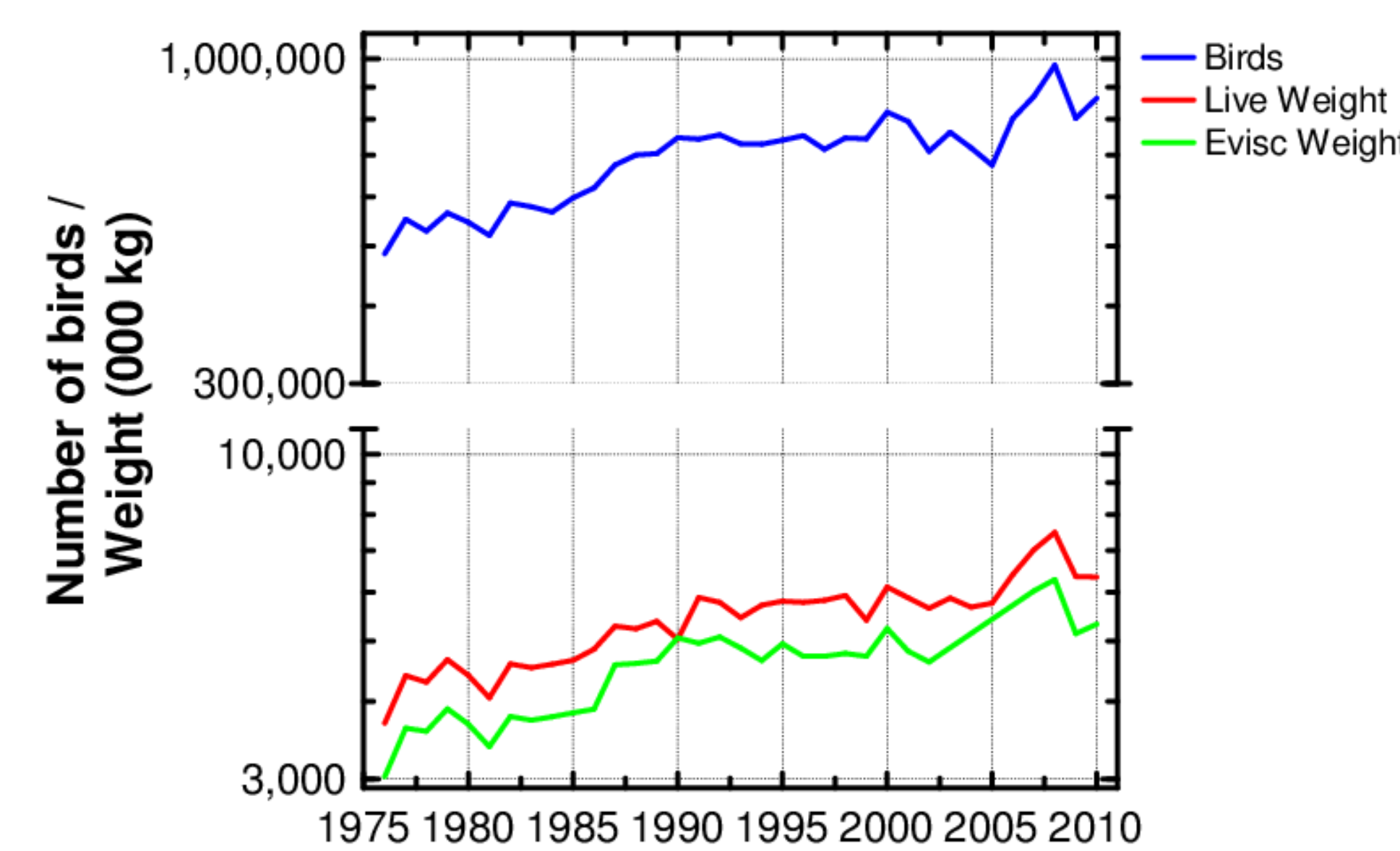
## Results and Discussion

Registered Turkey Production



- the number of turkey producers declined during the late 1970s until the early 1980s, then increased slightly up to the late 1980s, stabilized to the mid-1990s, and has since continuously declined

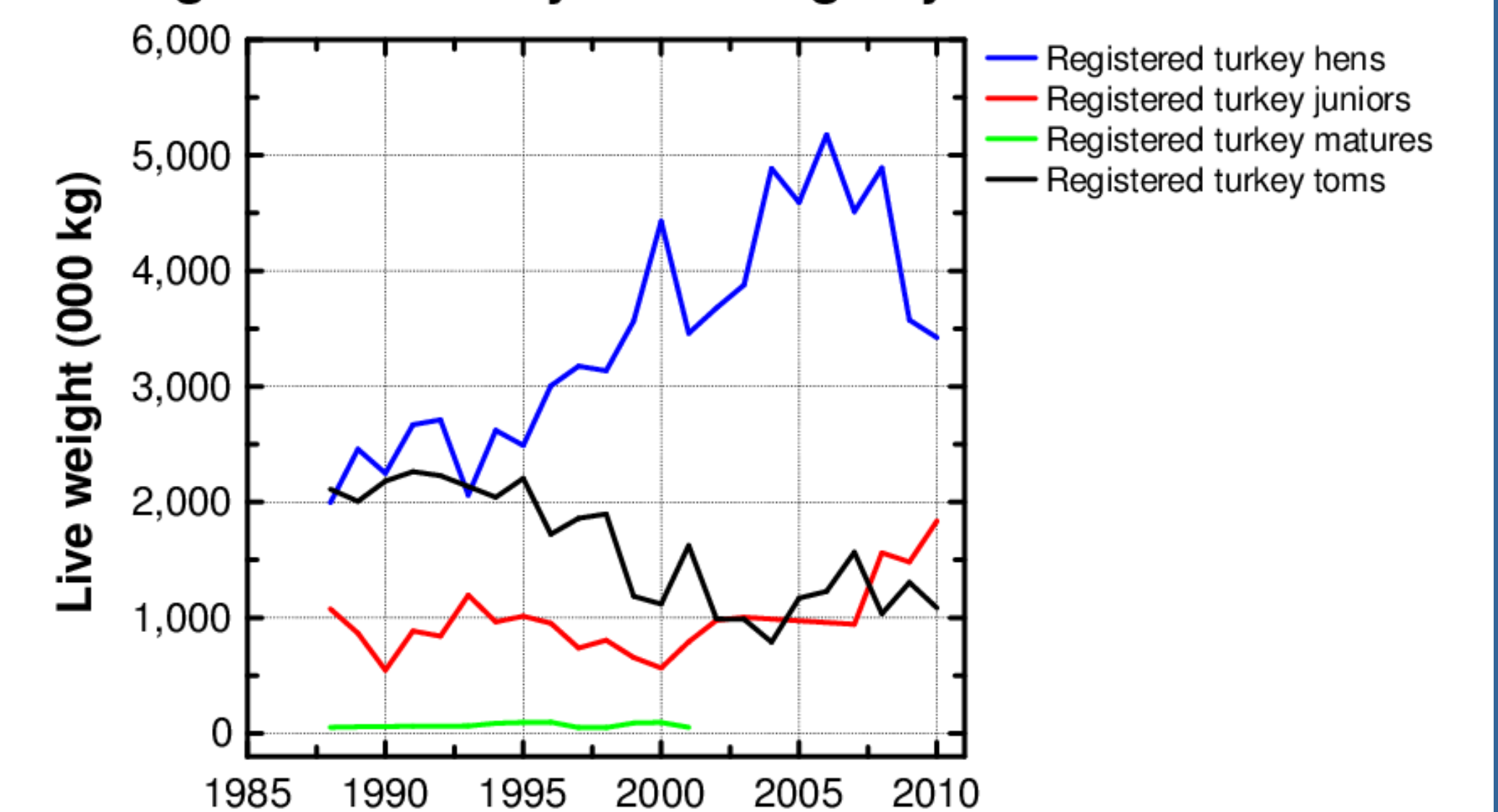
Registered Turkey Production



- the number of turkeys, as well as their live and eviscerated weights, have been consistently increasing since the mid-1970s

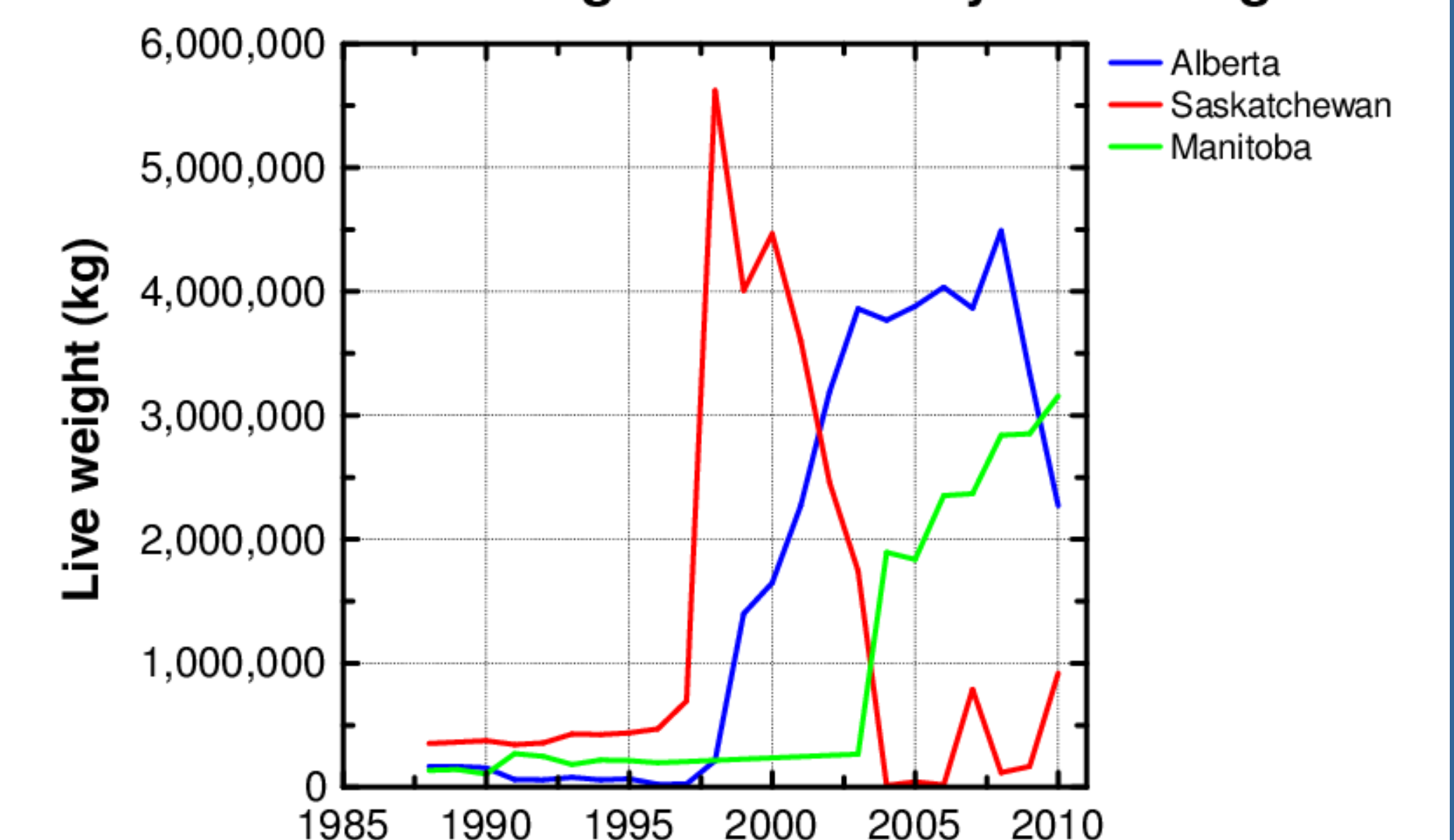
## Results and Discussion

Registered Turkey Marketings by Class



- the weight of registered turkey hens increased steadily from the late 1980s until 2006 and has since declined significantly
- the weight of turkey juniors remained approximately constant up to 2007, after which it has increased slightly
- no change in the weight of turkey matures occurred between the late 1980s and the early 2000s
- the weight of turkey toms was stable up to the mid-1990s, then declined until the early 2000s, with approximately stable values up to the present

Destination of Registered Turkey Marketings



- the live weight of turkey marketings in Saskatchewan experienced a spike between the late 1990s and the early/mid-2000s, with approximately equal and stable quantities before and after the short-term increase
- turkey marketings into Manitoba did not change until the early 2000s, after which they have increased rapidly up to the present
- turkey marketings into Alberta were constant until the late 1990s, then rose rapidly until 2008, and have declined substantially over the past two years

# Time Trends for Livestock Production in Saskatchewan, Canada: 1905-2011



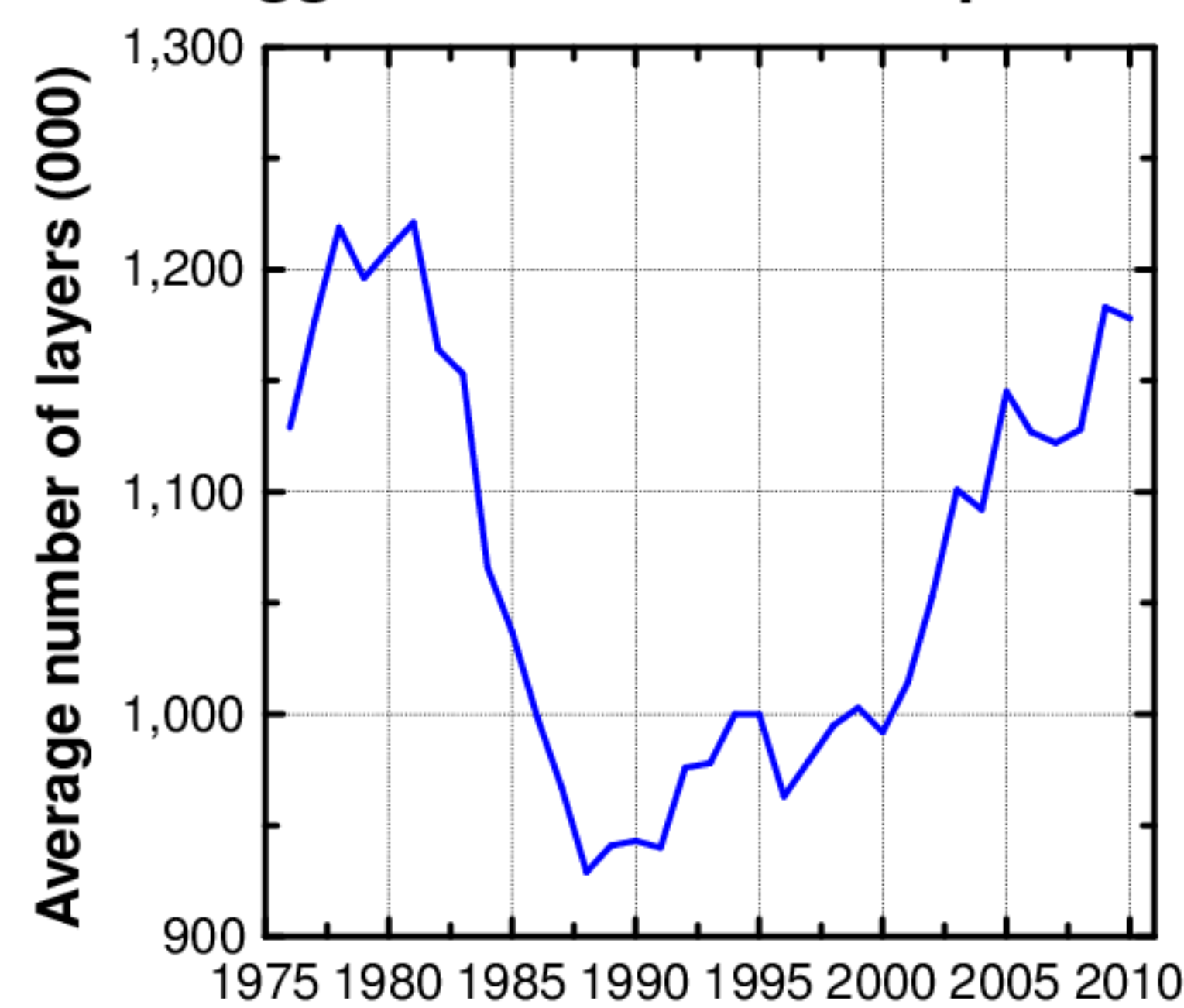
Sierra Rayne<sup>a</sup> and Kaya Forest<sup>b</sup>

<sup>a</sup> Chemologica Research, PO Box 74, 318 Rose Street, Mortlach, Saskatchewan, Canada, S0H 3E0; e-mail: rayne.sierra@gmail.com

<sup>b</sup> Department of Environmental Engineering, Saskatchewan Institute of Applied Science and Technology, Palliser Campus, PO Box 1420, 600 6th Avenue NW, Moose Jaw, Saskatchewan, Canada, S6H 4R4; e-mail: kaya.forest@siast.sk.ca

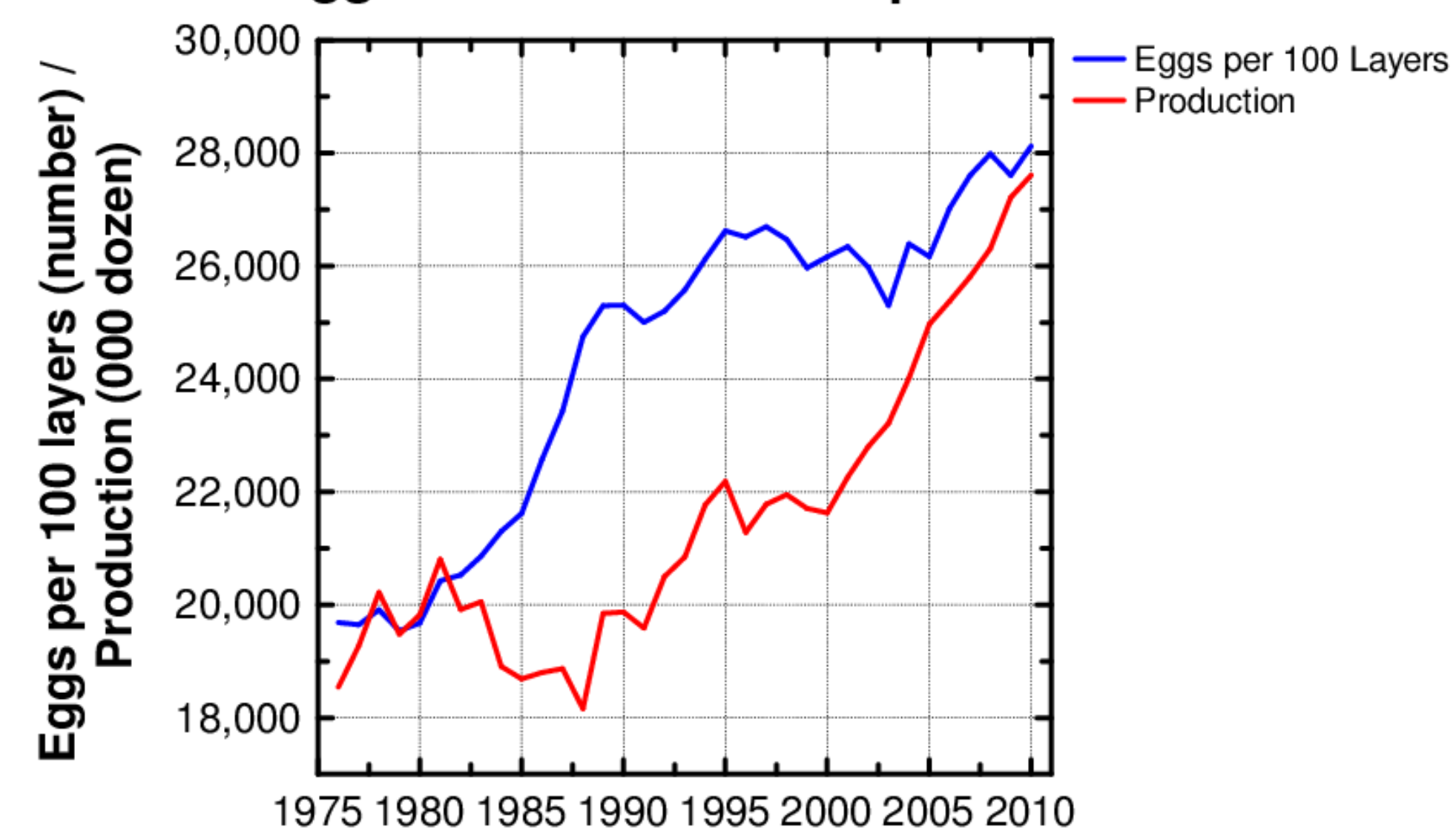
## Results and Discussion

**Egg Production and Disposition**



- the number of egg layers increased slightly during the latter half of the 1970s, then decreased continuously until the late 1980s, and has since increased steadily to the present back up to the historic highs of the late 1970s

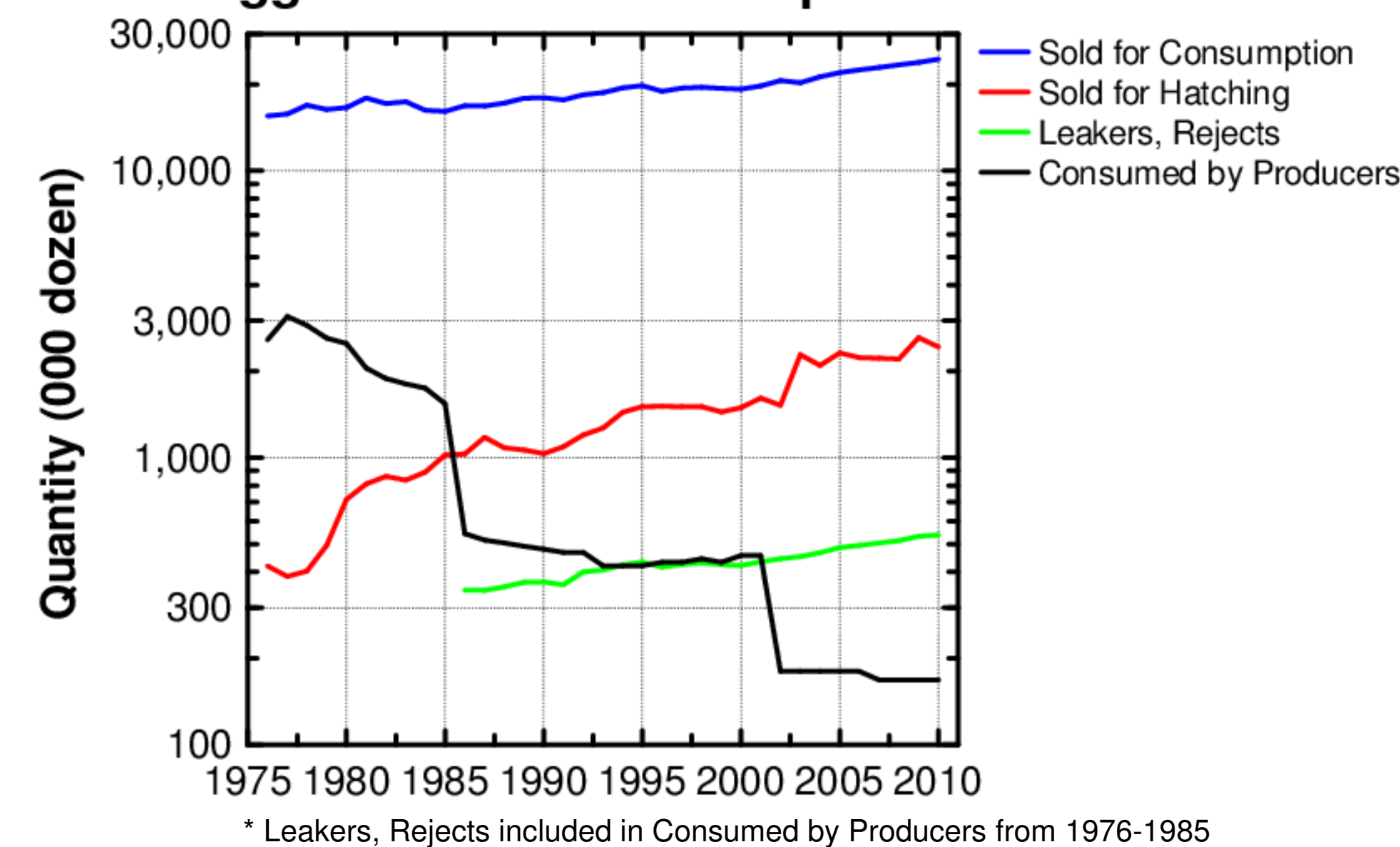
**Egg Production and Disposition**



- the numbers of eggs per layer has increased continuously since the mid-1970s
- egg production was effectively stable from the mid-1970s to the mid-1980s, after which it has increased continually up to the present

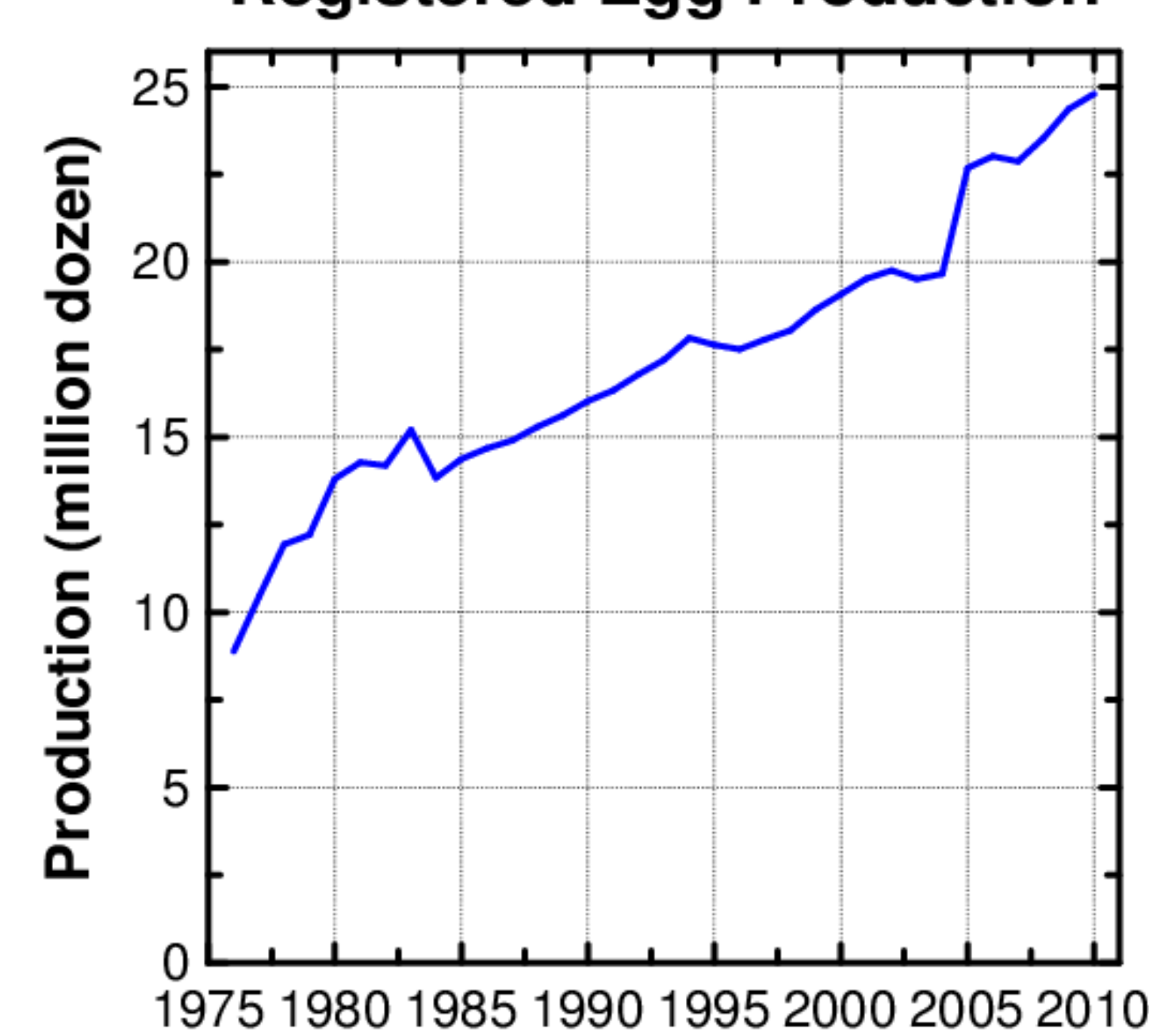
## Results and Discussion

**Egg Production and Disposition**



- eggs sold for consumption and hatching have both increased consistently since the mid-1970s, as have leakers and rejects
- eggs consumed by producers have consistently declined in a step-like fashion (major downward trends in the mid-1980s and early 2000s) since the mid-1970s

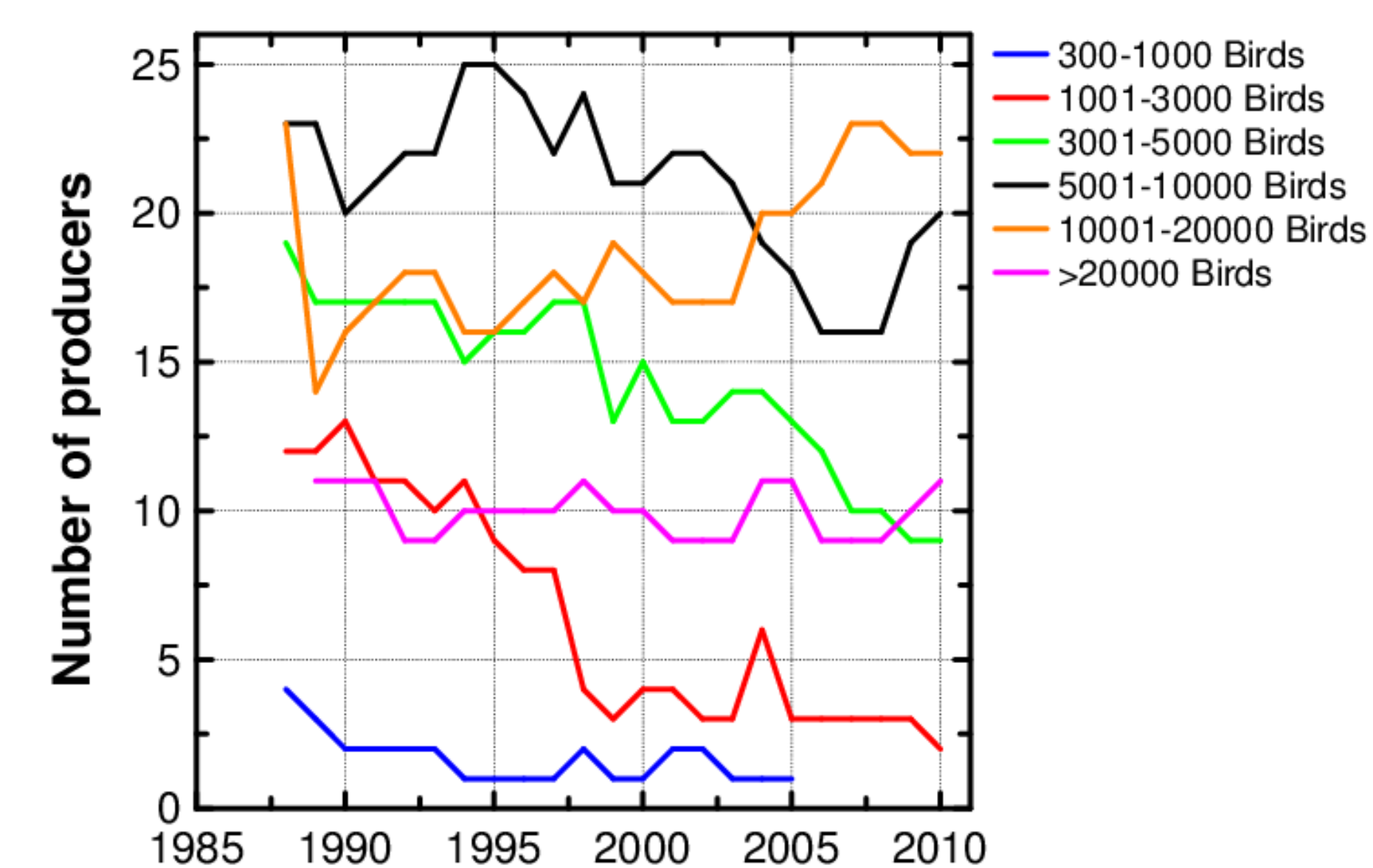
**Registered Egg Production**



- registered egg production has increased steadily since the mid-1970s

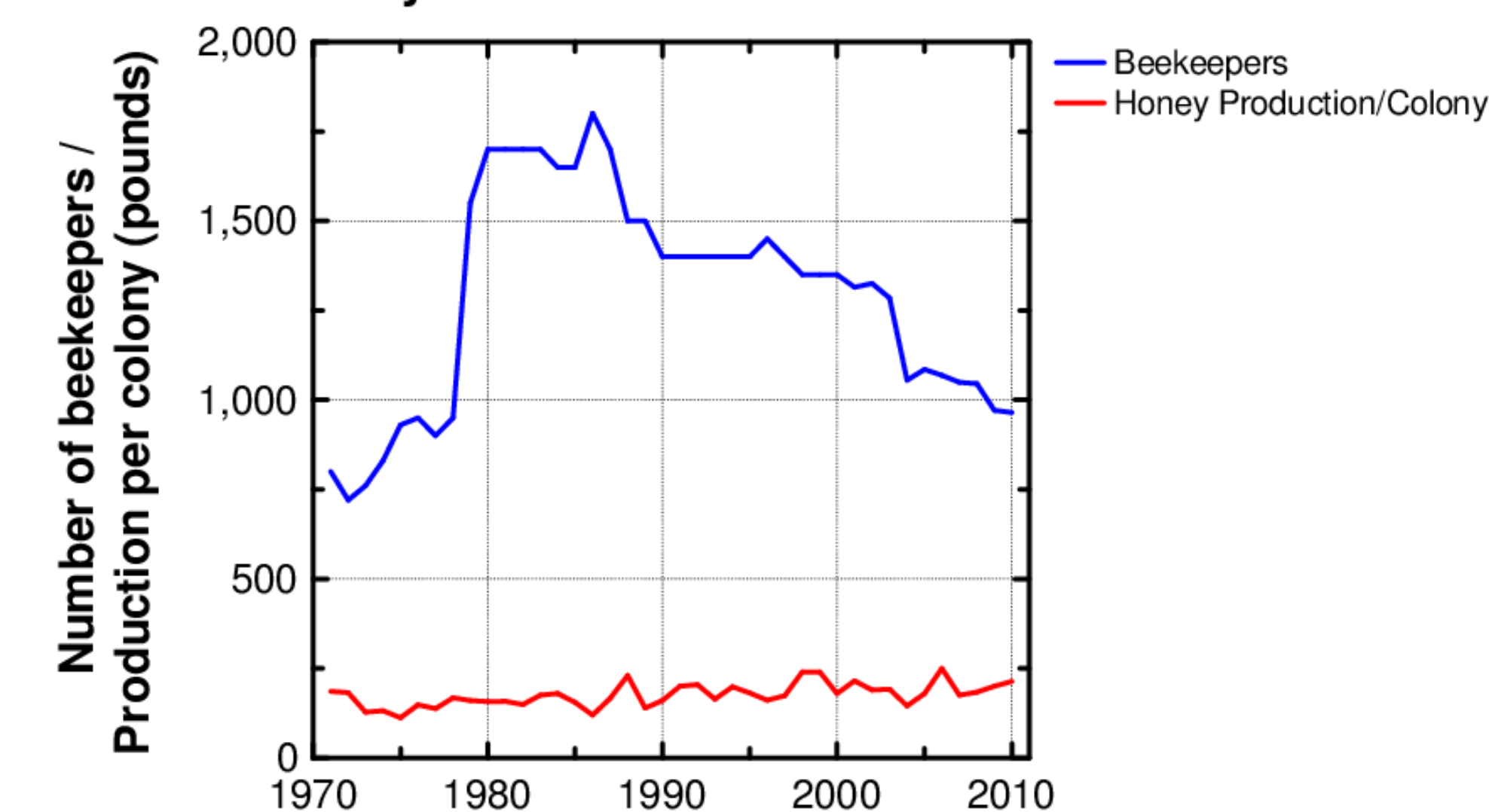
## Results and Discussion

**Distribution of Registered Egg Quota Holdings**



- the number of small/mid-size egg producers has been decline since the mid-1980s, with no substantial trends for the smallest and largest producers

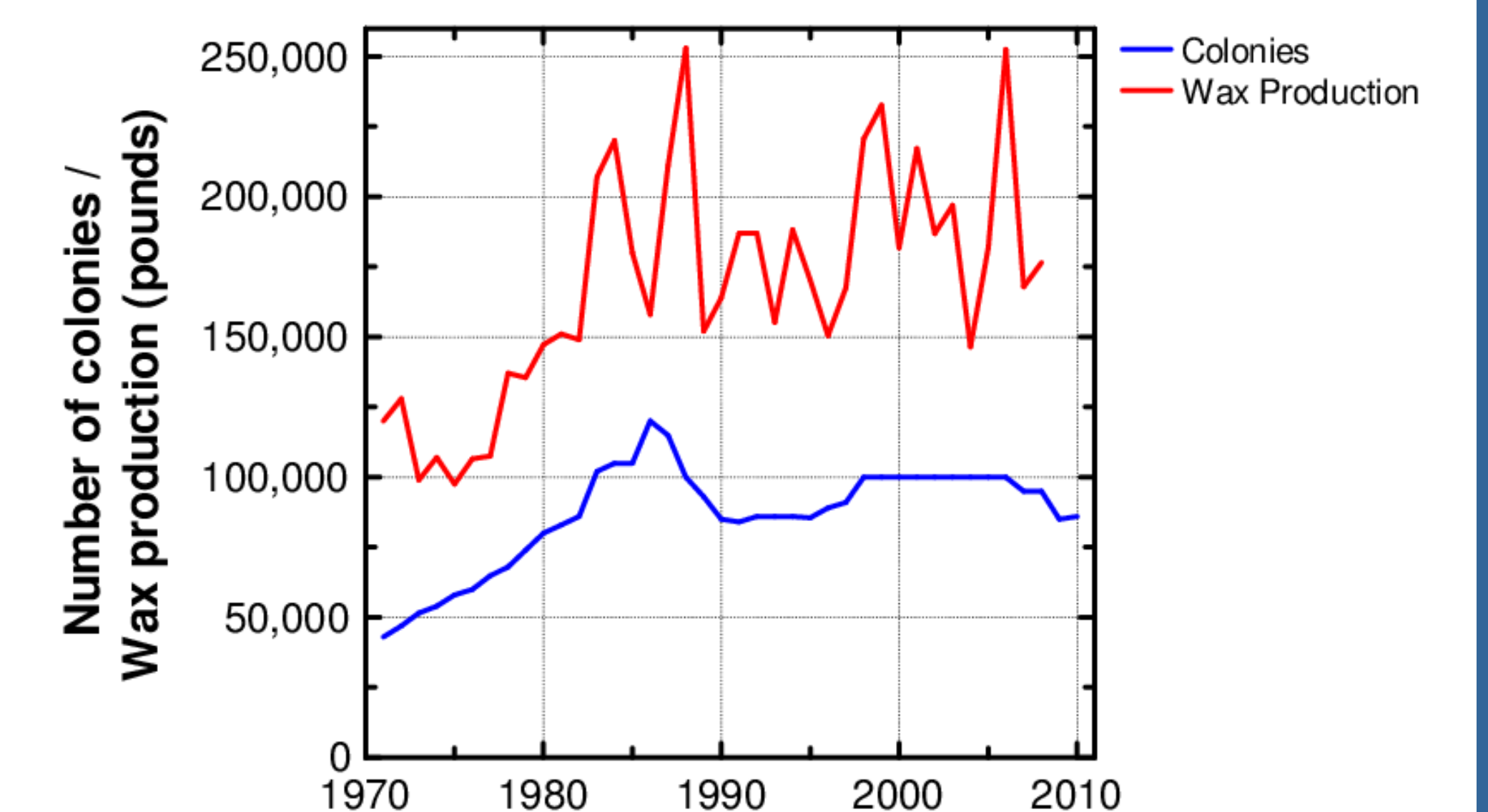
**Honey and Beeswax Production**



- honey production per colony has remained constant since the early 1970s
- the number of beekeeper rose rapidly in the late 1970s and has been in continuous decline since the early to mid-1980s

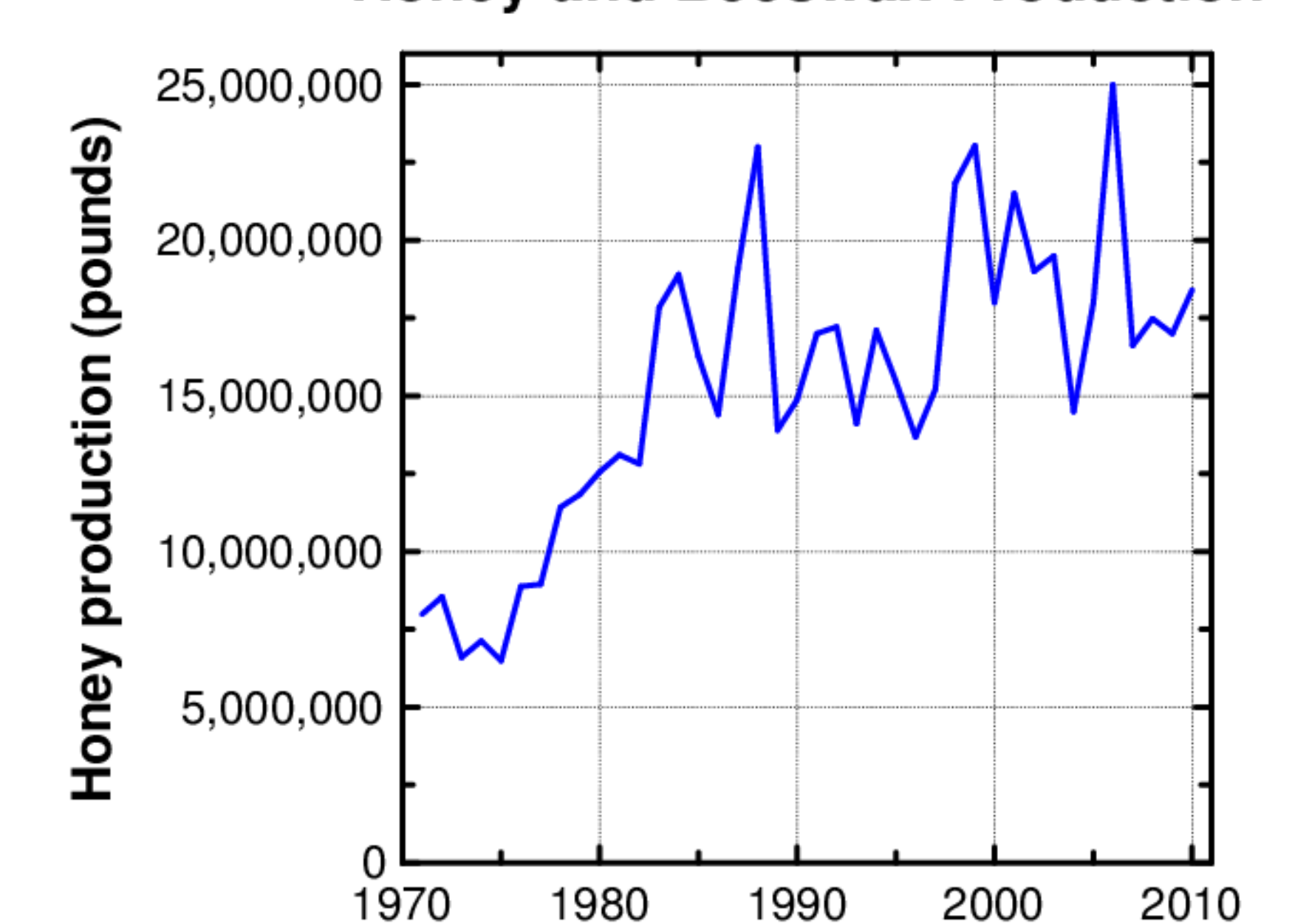
## Results and Discussion

**Honey and Beeswax Production**



- the number of colonies increased steadily during the 1970s and up to the mid-1980s, after which it declined slightly and remained approximately constant up to the present
- wax production followed a similar trend, except with substantially higher variability from the 1980s to the present

**Honey and Beeswax Production**



- honey production increased steadily during the 1970s and up to the mid-1980s, after which it has remained approximately constant with high year-to-year variability