Cutting ratio and nutrient analysis of goose carcass

Qingxian Nan, Wenji Li, Xuefang Pu

Abstract

Chengde white geese are a strain of geese of small size. Raised at large, the average live weight of one-month age ge geese is 3.78kg, and that of female ones is 3.46kg. Slaugher yield is 71.30%, semi-eviscerated yield is 77.54%, eviscerated yield is 63.21%. After the carcass is cut, the percentage of skin and abdominal fat is 25.5%, bone is %, meat is 53.3%, and the percentage of high quality meatfrom breast and leg is 31.2%.

The nutrient composition of goose meat: protein, 22-24%; fat, 3-5%, similar to beef; Ca 0.01-0.015%, is very low; P 0.243%, is high; The fat content of goose bones vary considerably. Fat content in leg bone is the highest, 2%.

eat at neck and frame is difficult to cut down, the bone-meat ratio of neck and frame is 2:1, 1:1 respectively. er being ultra-minor grounded, the bone paste contains; protein, 60-65.6%; fat 12-18.98%. The shape of bone rticles is amorphous. The diameter of most bone particles is less than 100μm, and about 50% is below 20μm.

Introduction

The goose raising history in China is very long. The earliest records of goose production is in Xihan dynasty .C.). Through long-time raising selection now, there are a lot of good strains of geese availible, such as, ou, Taihu geese, Tupu geese. Because of Chinese agriculatural character, wide grass resources and the demand of ter, the goose raising in China develops very quickly. There are more than 350 million geese in China, the most the world. However, because of the limitation of production capability, raising system and consumer habit, the number oose raising is far below compared with duck! Raising geese in husbandry is not very important. Research reports aterials on geese are few.

Through research in meat yield cutting ratio and analysis of meat-bone components of chengde white geese, lots of ntific data of goose carcass processing, meat quality evaluation, raising style and the differences among goose ins were provided.

Materials and methods

一、Slaughter determination: Geese are taken from Chengde, Hebei province, sampled from 400 geese at random, 20 e and female respectively. The age of geese is 4 months. Geese are slaughtered after 24 hour fasting, and ecting distinct difference analysis. The items of analysis include:

1.Live weight: Slaughtered weight, semi-eviscerated weight, eviscerated weight, breast and leg weight.

2.Carcass cutting part weight: breast, leg, wing, neck and frame.

3. Determining the meat-bone ratio of leg, neck, frame.

二、Chemical analysis of goose meat and bone:

The carcass of geese analysed is sampled at random, 3 of male and female respectively. Cut down their breast meat, eat, neck meat, bone meat, leg bone, neck bone, and frame.

1.Sample preparation: meat sample is grounded and weighed, then dried at 45℃, -650mmHg vacuum, 24 hours. ied after the sample reaching constant weight again. The dry, grounded sample is prepared.

one sample is dried at 45℃, -650mmHg vacuum, 24 hours, then grounded. At the same condition, dry for 6 hours dition. Then grounded again and stored in bottles.

2. Analysis: water: $$\text{water}=\frac{\text{(sample weight-dry weight)}}{\text{sample weight}}\times 100\%$$

fat: Goldfisch Extraction Analysis Method.

Protein: Kjeldahl Protein Analysis Method.

Ca: $KMnO_4$ Analysis Method.

P: Colorimetric Method.

Result and Analysis

一、Slaughter Analysis:

(一)Determination of meat yield of goose carcass.

Slaughtered weight, carcass weight, semi-eviscerated weight, eviscerated weight, breast and leg weight of engde white geese show in table 1.

The average weught of this kind of geese is less than 4Kg. Male goose's weight is slightly higher than female. tatistical singnificance analysis of live weight, t=8.035, the difference between male and female is very significant.

emi-eviscerated and eviscerated weight, which indicaters meat yield capablixty, are 77.56% and 63.63% respectively. ese's similiar to Chinese local small-size geese, but lower than large size ones. See table 2.

Table 1: Determination of goose Carcass (unit: Kg %)

item / data / sex	live weight	slaughter weight	carcass weight	percentage of slaughter	percentage of semi-eviscerated	percentage of eviscerated	percentage of breast and leg
male geese	3.78	2.695	2.41	71.30	77.54	63.21	31.20
female geese	3.46	2.454	2.20	70.90	55.57	63.60	30.5

Table 2: The weight and meat yield of Chinese local geese (unit: kg %)

Strain	Weight	semi-eviscerated Weight	Eviscerated Weight	Percentege of breast	Percentage of leg.
Tupu geese	4.42	77.2	65.2	18.4	20.2
Shitou geese	7.14	77.8	65.3	18.6	18.8
Zhi geese	4-4.2 3-3.5	78-80	71-74	19-21	21-23
Wutong geese	3.83	86	79	—	—
Daixian geese	3.8	84	78	—	—
Zhedong geese	3.9	78.95	67.7	11.9	15.37
Wanxi geese	3.8	79	68.3-69.5	10.29	17

(二) Cutting ratio analysis:

1. The percentage of cutting part weight to live weight and carcass weight. see graph 3.

According to the table, there is some meat left in neck. It's meat-bone ratio is 2:1, but the meat- bone ratio of frame is only 1:1.

Through analysing research data above, we can get the information which indicates the quality of goose carcass. The meat which can be used in processing is up to more than 50% of carcass weight, About 60% of meat is breast and leg meat. The male geese is better than female in meat yield and quality.

Table 3: Percentape of part weight of goose carcass (unit: %)

item	average of male %	average of female %	statistical t	distinction	significant analysis difference of distinction %	average of undistinction %
carcass weight to live weight	63.60	63.21	1.0951			63.41
head weight to live weight	4.68	4.63	0.9210			4.66
claw weight to live weight	2.87	2.85	0.4818			2.86
weight to live weight	16.56	16.75	0.8669			16.60
bread weight to live weight	5.10	4.48	5.3631	**	0.62	
feather weight to live weight	7.19	8.08	6.0827	**	-0.89	
skin weight to carcass weight	21.91	23.21	3.2954	**	-1.30	
abdominal fat weight to carcass weight	3.62	4.54	3.4326	**	-0.92	
neck weight to carcass weight	8.66	7.68	0.8169	**	0.98	
breast weight to carcass weight	14.89	15.44	3.2182	**	-0.55	11.86
wing weight to carcass weight	11.94	11.78	1.1590			
leg weight to carcass weight	20.62	19.45	7.5857	**	1.77	
frame weight to carcass weight	18.36	17.90	2.2319	*	0.46	

2. The determination of meat bone of cutting parts see table 4

table 4: the meat-bone ratio of leg, wing, frame (unit: %)

item / data / sex	leg		wing			neck		frame	
	meat	bone	lower wing	upper wing meat	upper wing bone	meat	bone	meat	bone
male geese	78.93	21.07	17.24	46.04	36.69	67.50	32.50	57.12	42.88
famale geese	77.63	22.37	17.32	45.07	37.61	64.02	35.98	54.53	45.47

Frame and neck occupy a high proportion to carcass. The meat clinging to the bone is amount to about 30% of total weight, and is difficult to cut down. So, me problem is how to use the animal protein which needs to be searching. table 5.

Table 5: Carcass quality analysis (unit: %)

	skin	bone	meat	percentage to carcass meat			
	abdominal fat			breast	leg meat	neck frame meat	wing meat
geese	25.5	21.2	53.3	58.5	30.1		11.4
le geese	27.9	21.5	50.6	60.3	29.1		10.6

The nutrients of goose cutting parts.

Meats of different parts of carcass and bone component analysis.

After slaughtering the geese, we can see that the fat is concentrated under skin and abdomen. There is only little inside meat. The result of chemical analysis is indicated at table 6.

The result of analysis indicate: the protein content of goose meat is 22-24%, fat is 3-5%. Goose meat is a kind of which have high protein, low fat, similar to that of beef (protein 20.3%, fat 6.2%), higher than that of duck chicken.

The meat of frame is similar to that of breast and leg, but is small, scattered. Processing is time- consuming. meat-bone separation machine is used to obtain meat paste or meat-bone paste.

The components of meat and bone are quite different vary greatly, mainly in water content and ash content. The ter content of meat is above 70%, but that of bone is only 20-40%. Leg bone only contain about 20% water, and more 20% fat.

The Ca content of meat is very low. The ratio of Ca to P is about 1:15. The goose meat is a kind of food with read ratio of Ca to P. The Ca content of bone is high, about 10%, and the ratio of Ca to P is 2:1.

table 6: meat, bone component analysis (unit: %)

Component / data / sex / type		Water	protein	fat	ash	Ca	P
east meat	male	70.44	24.82	3.58	1.16	0.009	0.243
g meat	female	71.22	23.72	3.92	1.14	0.012	0.234
g meat	male	71.09	23.18	4.61	1.12	0.015	0.214
	female	70.96	22.29	5.66	1.09	0.014	0.215
ame meat	male	71.38	23.72	3.90	1.00	0.012	0.172
	female	71.42	23.58	4.03	0.97	0.013	0.214
g meat	male	70.53	24.02	4.32	1.13	0 014	0.206
	female	71.48	22.82	4.76	1.04	0.014	0.187
g bone	male	21.90	26.09	23.27	28.74	11.15	4.72
	female	22.46	25.85	22.11	29.58	11.24	5.01
ame bone	male	43.64	31.22	2.95	22.19	8.32	3.59
	female	42.20	34.12	2.63	21.05	8.35	4.05
	male	40.10	31.16	6.68	22.06	8.45	3.55
	female	40.75	27.66	8.43	23.16	7.45	3.34

The components of bone paste and its diameter change analysis.

After ultra-minor grounded, the components of bone paste is indicated at table 7.

The ash contents of the 4 kinds of bone paste are all about 3%, Ca contents are about 1%. Infuenced by adding ater in processing, the water contents of bone paste are 70-80%. The components of different bone paste are mpared in table 8.

Table 7: The determination of bone paste components (unit: %)

item \ Component data	Water	protein	fat	ash	Ca	P
Bone paste of swine leg	69.26	11.69	10.27	8.78	3.31	1.32
Bone paste of Chicken frame	75.76	11.78	9.25	3.21	1.05	0.48
Bone paste of goose neck	79.78	13.27	2.60	4.35	1.61	0.69
Bone paste of goose frame	80.56	11.76	3.69	3.99	1.50	0.67

Table 8: The components of dry bone paste (unit: %)

	Protein	fat	ash	Ca	P
Bone paste of swine leg	38.15	33.41	28.56	10.77	4.29
Bone paste of Chicken frame	48.59	38.16	13.24	4.33	1.98
Bone paste of goose neck	65.63	12.86	21.51	7.96	3.41
Bone paste Ⅰ、Ⅱ of goose frame	60.49	18.98	20.52	7.72	3.45

Indicated at table 8, the bone paste of neck and frame has a higher protein content, about 60-65%. On the contrary, the meat on swine bone is easy to cut down, and the protein content of its bone paste is low, about 38.15%, but its ash content is high, about 28.56%. Because the bone of chicken hasn't calcificated, its ash content is low.

Discussion

1. Research work indicate that the small size Chengde white geese are light weight, although they are raised at large. Their semi-eviscerated ratio and eviscerated ratio, indicators of meat yield, are similiar to that of the Chinese large size Shitou geese and Beijing Huangji.

2. In the cutting parts of goose carcass, the frame and neck bone occupys. There is much meat clinging to them. How to use them better is an important factor influencing the development of goose raising.

3. Small size geese are famous for their rapid growth and high quality meat. But in the later part of its growth period, what grows most fast is the skin, fat and collagen. This character is important to improve raising techniques and strain choice.

Reference

1. Chen Yuxin etc. 1984. Chinese geese. The symposium of the second poulty research congress China.
2. Bo Yuhua. 1988. The ealy fattening of Wanxi white geese, the symposium of the 18th internatural poultry production congress. China.
3. Mao Zhaosheng, 1988. The goose production of Hunan province. The symposium of the 18th internatural poultry production congress. China.
4. Nan Qingxian, 1989. The summary of internatural poulty development and poulty processing. Chinese technical exchanging congress of natural goose comprehensive usage. China.
5. Zhao Xiao, 1988. The goose raising in Jianshu provice, Chinese poulty (2) 18-22, China.