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# A Study on Proximate Analysis of Chicken Intestine and Chicken Skin

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***Abstract*- In the present study, percentage of protein, fat, moisture, ash and carbohydrates of poultry by product was studied. For this analysis poultry by product were collected from dining and restaurant. For chicken intestine the intestine percentage of protein, fat, moisture, ash and carbohydrate was 68.28%, 8.64%, 7.37%, 4.33% and 11.40% respectively. For chicken skin the percentage of protein, fat, moisture, ash and carbohydrate was 22.16%, 47.64%, 9.2%, 11.14% and 10.86% respectively. Percentage of protein was more in intestine than skin. Percentage of fat content was more in skin than intestine. Percentage of moisture content was similar between intestine and skin. Percentage of ash content was more in skin than intestine. Percentage of carbohydrate content was similar between intestine and skin.**

***Keywords*- Poultry, Chicken, Intestine, Skin, etc.**

## I. INTRODUCTION

Bangladesh is a small agro based country. Aquaculture especially fishery is one of the successful operations. This sector is playing an important role in the development of Bangladesh. Still fisheries sector contributes 3.74% of GDP and 23% of total agricultural product fulfilling about 63% of animal protein. It provides huge employment opportunity every year in processing industry, hatchery etc. fisheries items like fish, shrimp, and crab are giving a major portion of total export earnings such as in year 2012-13 total export earning value was 25727.2 million BDT (Rob, M G M 2008).

In our country there was time when the country was full of natural water bodies and resources people would practice traditional aquaculture but situation has changed. Now aquaculture practice is moving traditional to industrial operation. For industrial and commercial operation there must need of artificial feed. Better feed composition result in higher production and lower feed cost. In feed development, there should have a provision of continuous investigation of raw materials and feed management in the mills and industries. But escalating cost, uncertainty unavailability and lesser quantity and increasing demand have necessitated the use of other protein sources to reduce feed cost without compromising growth. Therefore, it is imperative to find alternative protein sources of good quality which are less expensive and readily available as substitute for fish ingredients.

In Bangladesh more than 5.5 million of broiler is slaughter annually which produces a huge amount of by product like viscera, skin, head, and leg (Hasan et al, 1993; Rob, M G M 2008). These are considered as waste. In our country proximate analysis of chicken product is barely observed. So, this work will be the pioneer work to find out the proximate components of chicken by products and to make a comment on the possibility of replacing these by products as feed ingredients for fish and veterinary animals in future.

## II. MATERIALS AND METHODS

**1. Sample Collection:**
As chicken viscera is available, almost everywhere at any time. So, it doesn't need to mention a sampling spot and sampling date.

**2. Materials:**
Knife, Forceps, Polybags, Tag, Grinder, Rope and Vial were used.

**3. Sample Preparation:**
Poultry by products, intestine and skin are collected and these are washed in tape water, kept them for air dry separately for 2 hrs. After drying they were transferred for sundry until necessary period. These two samples were shifted in the lab grinding to make powder. By grinding machine these dried sample were made into powder at size of 0.1 mm. then the samples were stored in the air tight vial. At last, these samples were preserved for proximate analysis.

## III. LABORATORY ANALYSIS

Determination of protein (micro-kjeldhal method) development, there should have a provision of continuous investigation of raw materials and feed management in the

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mills and industries. But escalating cost, uncertainty unavailability and lesser quantity and increasing demand have necessitated the use of other protein sources to reduce feed cost without compromising growth. Therefore, it is imperative to find alternative protein sources of good quality which are less expensive and readily available as substitute for fish ingredients.

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**1. Principle:**
The nitrogen of protein was converted to amino acid ammonium sulphate by digesting with sulfuric acid in presence of catalyst mixture. On making the reaction miture alkaline, the liberated ammonia was distilled off and absorbed in boric acid solution containing an indication. Change in pH of the acid solution due to addition of ammonia in indicated by the indicator dye.

When complete absorption was ensured the solution was back titrated with standard 0.1 HCL. The amount of HCL consumed in back titration of the ammonia boric acid solution was proportional to the amount of ammonia liberated.

Percentage of nitrogen was calculated by the titrate value, which was converted into (g) % protein present in the sample by multiplying the % of nitrogen with conversion factor 6.25.

**1.1 Calculation:**
- % N= (Amount of HCL required ×normality of HCL×0.014×100)/(weight of sample)
- Percentage of protein=% N×of Conversion factor
- Conversion factor for animal is 6.25

**2. Determination of Fat:**
**2.1 Principle:** Fat can be determined by extracting the material paste with light petroleum in a Soxhlet type of extractor and the extract is weight after careful recovery of solvent. It is advisable to extract the sample first with 99% alcohol only to ensure maximum surface expose of sample so that free and bound fat can be extracted by the extracting solvent.

**2.2 Calculation:**
- % of fat= (weight of fat after complete evaporation of solvent)/ (weight of the crushed sample) ×100

**3. Determination of moisture (oven method):**
**3.1 Principle:** The wet tissue is allowed to dry by keeping it in an oven at 100-105 0C and cooling in desiccators. The difference between the weight at tissue and its dry weight gives the amount at moisture present in the tissue.

**3.2 Materials:** Oven, Analytical balance, Porcelain crucible and Desiccators were used.

**3.3 Calculation:**
- % of moisture= (weight of sample-dry weight of sample)/ (weight of sample) ×100

**4. Determination of Ash:**
**4.1 Principle:** On heating the sample to higher temperature (500-600 0C) all organic constituent are burnt leaving only the inorganic constituent in the form of ash.

**4.2 Materials:** Oven, Analytical balance, Drying, Porcelain crucible andDesiccators were used.

**4.3 Calculation:**
- Weight of Ash= (weight of ash+crucible)-weight of crucible
- % of Ash content= (weight of ash sample) ×100

## IV. RESULTS AND DISCUSSION

**1. Percentage of protein, fat, moisture, ash, carbohydrate in chicken intestine.**

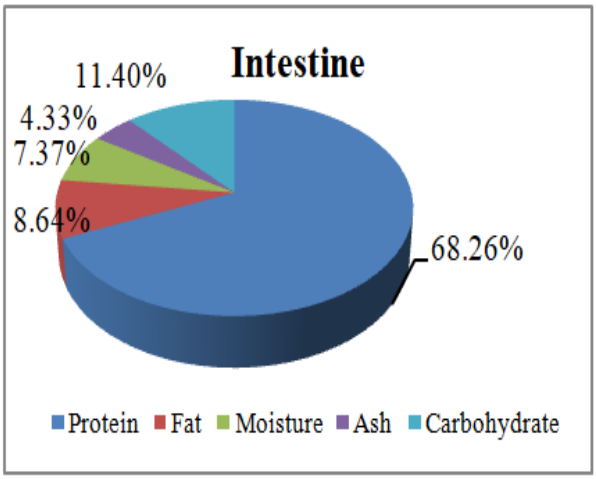


Fig 1. Pie chart of proximate analysis of chicken intestine.

For chicken intestine the intestine percentage of protein, fat, moisture, ash and carbohydrate was 68.28%, 8.64%, 7.37%, 4.33% and 11.40% respectively. Protein percentage is very high in chicken intestine which is more than soyabean, soyabean meal (approx. 25-35%) and meat and bone meal (approx. 45-60%).

For chicken skin the percentage of protein, fat, moisture, ash and carbohydrate was 22.16%, 47.64%, 9.2%, 11.14%

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and 10.86% respectively. Protein percentage is not high in chicken skin but better than the rice polish but problem is high fat content.

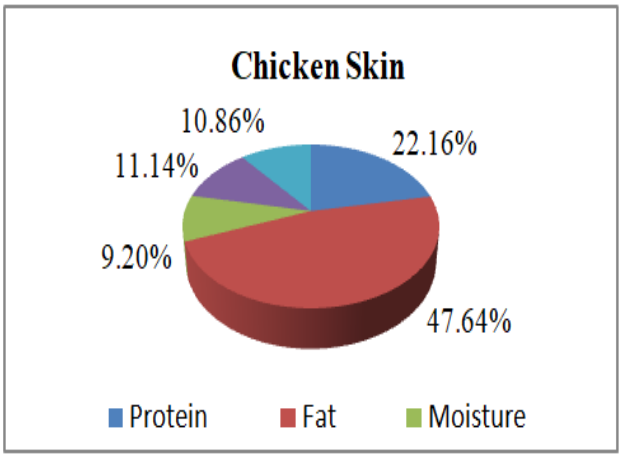


Fig 2. Proximate composition of chicken skin.

**2. Comparison of nutrient contents between the intestine & skin:**

**2.1 Protein:**

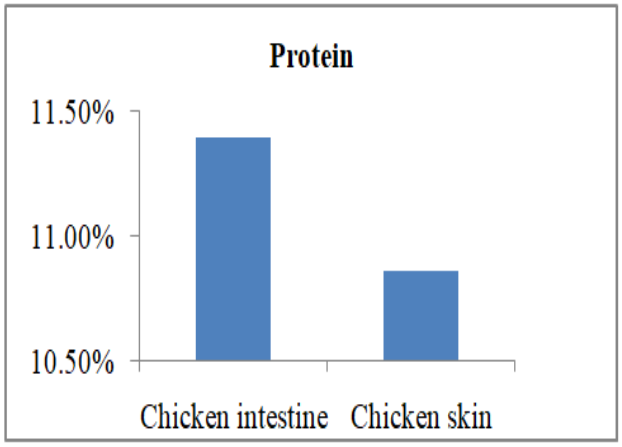


Fig 3. Protein contents between the intestine & skin.

**2.2 Fat:**

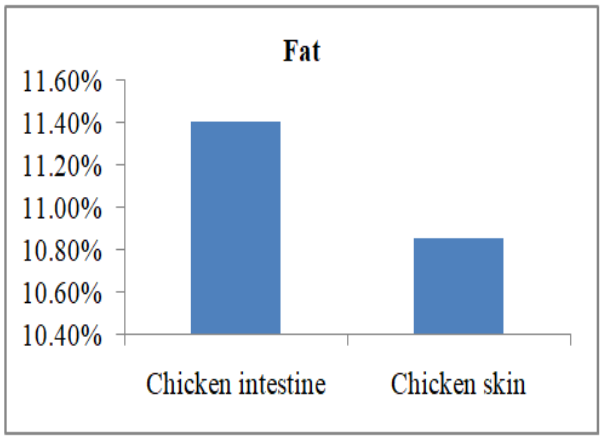


Fig 4. Fat contents between the intestine & skin.

**2.3 Moisture:**

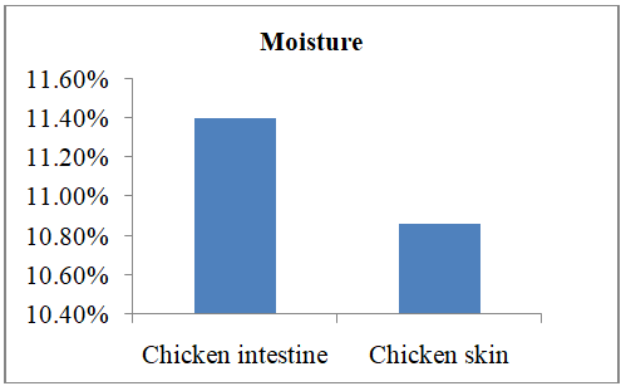


Fig 5. Moisture contents between the intestine & skin.

**2.4 Ash:**

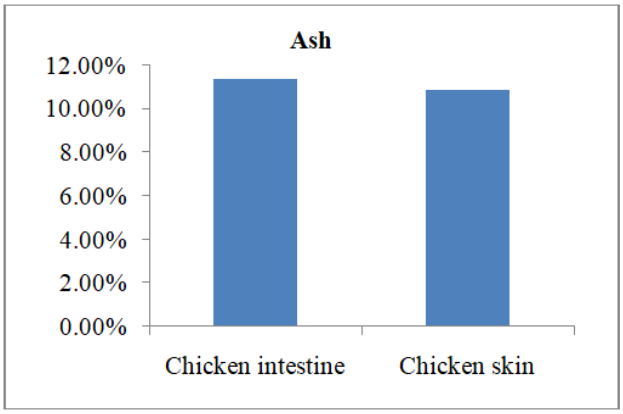


Fig 6. Ash contents between the intestine & skin.

**2.5 Carbohydrates:**

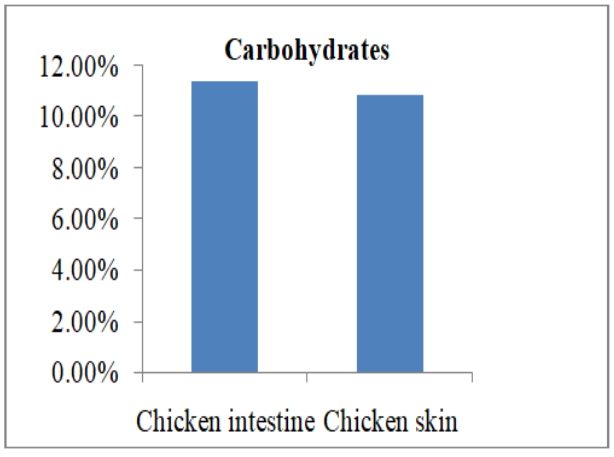


Fig 7. Carbohydrates contents between the intestine & skin

**3. Percentage of different portions of chicken (in 1 kg):** Percentage analysis of different portions of a chicken revealed that its intestine, skin, feather and other visceral products consist about 25% of the total weight of the chicken. Skin is somewhere used as food for human consumption; but the intestine, feather and other visceral products consist about 21% of the total weight. Interesting is, these portions are totally discarded and fallen through

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to the dustbin in all the places just as a waste material. But present research proved that these materials contain a valuable protein which is most important factor and urgent feed nutrients for aquaculture feed formulation.

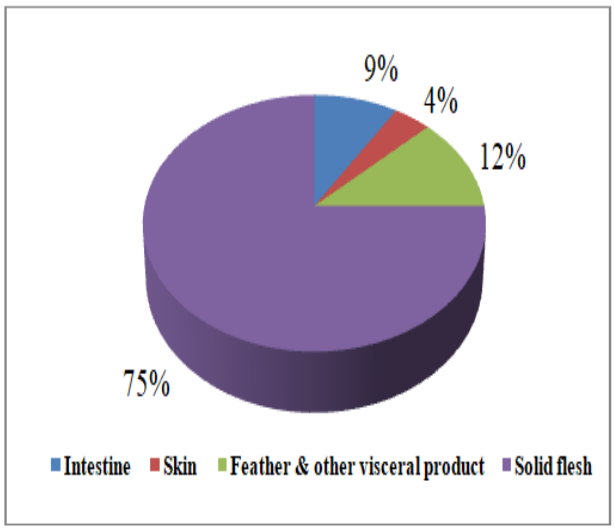


Fig 8. Pie chart of different portions of chicken (in 1 kg)

## V. DISCUSSION AND RECOMMENDATIONS

The proximate analysis of protein, fat, moisture, ash, and carbohydrates varies between the chicken intestine and skin. The of protein, fat, moisture, ash, and carbohydrates contents of chicken intestine are 68.26%, 8.64%, 7.37%, 4.33%, and 11.4% respectively. According to Amtul Bari et Al (2012) the amount of protein, fat, moisture, ash, and carbohydrates were 71.14%, 7.67%, 4.33%, 6.66%, and 10.8% respectively.

There is variation in moisture and ash content but similar in protein, fat, carbohydrates content. Protein percentage is very high in chicken intestine which is more than soyabean, soyabean meal (approx. 25-35%) and meat and bone meal (approx. 45-60%). So, chicken intestine can be used as feed ingredients for aquaculture and all other veterinary feeds.

The protein, fat, moisture, ash, and carbohydrates contents of chicken skin are 22.16%, 47.64%, 9.2%, 11.14%, and 10.86% respectively. Protein percentage is not high in chicken skin but better than the rice polish but problem is high fat content. So, chicken skin cannot be used or should not be used as feed ingredients for aquaculture and all other veterinary feeds. Chicken skin can be used by deducting the fat content up to the desired level from the skin.

Percentage analysis of different portions of a chicken revealed that its intestine, skin, feather and other visceral products consist about 25% of the total weight of the chicken. Skin is somewhere used as food for human consumption; but the intestine, feather and other visceral products consist about 21% of the total weight.

Interesting is, these portions are totally discarded and fallen through to the dustbin in all the places just as a waste material. But present research proved that these materials contain a valuable protein which is most important factor and urgent feed nutrients for aquaculture feed formulation.

So, chicken intestine, feather and other visceral products can be used or should be used as feed ingredients for aquaculture and all other veterinary feeds formulation.

## VI. CONCLUSION

From the present study, it is obvious that chicken intestine contains high protein and skin has high fat component. So chicken intestine and skin can be used for aquaculture feed formulation due to their availability and high nutritional value.

Using of wasted by products may save environment from contamination (leaching of nutrients and pathogenic micro-organism) and air pollution (noxious gas and nuisance odor).

The best beneficial point of this study is if these samples can be replaced as fish ingredient, these will reduce the lion part of feeding cost in aquaculture industry.

**1. Appendix:**

Table 1. Proximate analysis of chicken intestine as dry weight.

| Sample Name | Chicken Viscera |
|---|---|
| Protein | 68.26% |
| Fat | 8.64% |
| Moisture | 7.37% |
| Ash | 4.33% |
| Carbohydrate | 11.40% |

Table 2. Proximate analysis of chicken skin as dry weight basis.

| Sample Name | Chicken Skin |
|---|---|
| Protein | 22.16% |
| Fat | 47.64% |
| Moisture | 9.20% |
| Ash | 11.14% |
| Carbohydrate | 10.86% |

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Table 3. Percentage of different portions of chicken (in 1 kg).

| Chicken | | |
|---|---|---|
| Intestine | 90 g | 9% |
| Skin | 40 g | 4% |
| Feather & other visceral product | 120 g | 12% |
| Solid flesh | 750 g | 75% |

## REFERENCES

[1] Amtul Bari Tabinda and Amna Butt (2012) worked on replacement of fish meal with poultry by product meal (chicken intestine) as a protein source in grass carp fry diet.
[2] Hasan et al, (1993) Studies on poultry offal meal and silk worn pupae meal as dietary protein sources for Indian major carp Catla catla (Hamilton). Bangla. I. Tarin. Dev., 6: 55-66
[3] Rob, M GM. 2008, Bangladesh poultry directory 8th edition Dhaka book house.

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