

### PROTEKSI ISI LAPORAN AKHIR PENELITIAN

Dilarang menyalin, menyimpan, memperbanyak sebagian atau seluruh isi laporan ini dalam bentuk apapun kecuali oleh peneliti dan pengelola administrasi penelitian

## LAPORAN AKHIR PENELITIAN TAHUN TUNGGAL

ID Proposal: 121a79e2-8c58-4dc4-824e-69c61151109e  
Laporan Akhir Penelitian: tahun ke-2 dari 2 tahun

### 1. IDENTITAS PENELITIAN

#### A. JUDUL PENELITIAN

EKSPLORASI TINGKAT EFISIENSI DAN DAYA SAING KEMITRAAN AYAM PEDAGING DALAM UPAYA PENGEMBANGAN AGRIBISNIS PERUNGGANAN BERBASIS BIAYA SUMBERDAYA DOMESTIK DI PROVINSI SULAWESI UTARA

#### B. BIDANG, TEMA, TOPIK, DAN RUMPUN BIDANG ILMU

Bidang Fokus RIRN / Bidang Unggulan Perguruan Tinggi	Tema	Topik (jika ada)	Rumpun Bidang Ilmu
Ketahanan Pangan	-	Ketersediaan pangan berbasis ketahanan dan kemandirian pangan	Sosial Ekonomi Perternakan

#### C. KATEGORI, SKEMA, SBK, TARGET TKT DAN LAMA PENELITIAN

Kategori (Kompetitif Nasional/ Desentralisasi/ Penugasan)	Skema Penelitian	Strata (Dasar/ Terapan/ Pengembangan)	SBK (Dasar, Terapan, Pengembangan)	Target Akhir TKT	Lama Penelitian (Tahun)
Penelitian Desentralisasi	Penelitian Dasar Unggulan Perguruan Tinggi	SBK Riset Dasar	SBK Riset Dasar	3	2

### 2. IDENTITAS PENGUSUL

Nama, Peran	Perguruan Tinggi/ Institusi	Program Studi/ Bagian	Bidang Tugas	ID Sinta	H-Index
ERWIN WANTASEN Ketua Pengusul	Universitas Sam Ratulangi	Peternakan		6009199	1
Dr SINTYA J K UMBOH S.Pt, M.Si Anggota Pengusul 1	Universitas Sam Ratulangi	Peternakan		6033763	0

### 3. MITRA KERJASAMA PENELITIAN (JIKA ADA)

Pelaksanaan penelitian dapat melibatkan mitra kerjasama, yaitu mitra kerjasama dalam melaksanakan penelitian, mitra sebagai calon pengguna hasil penelitian, atau mitra investor

Mitra	Nama Mitra
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#### 4. LUARAN DAN TARGET CAPAIAN

##### Luaran Wajib

Tahun Luaran	Jenis Luaran	Status target capaian ( <i>accepted, published, terdaftar atau granted, atau status lainnya</i> )	Keterangan ( <i>url dan nama jurnal, penerbit, url paten, keterangan sejenis lainnya</i> )
2	Publikasi Ilmiah Jurnal Internasional	accepted/published	

##### Luaran Tambahan

Tahun Luaran	Jenis Luaran	Status target capaian ( <i>accepted, published, terdaftar atau granted, atau status lainnya</i> )	Keterangan ( <i>url dan nama jurnal, penerbit, url paten, keterangan sejenis lainnya</i> )
2	Prosiding dalam pertemuan ilmiah Nasional	sudah terbit/sudah dilaksanakan	
2	Hak Cipta	terdaftar	

#### 5. ANGGARAN

Rencana anggaran biaya penelitian mengacu pada PMK yang berlaku dengan besaran minimum dan maksimum sebagaimana diatur pada buku Panduan Penelitian dan Pengabdian kepada Masyarakat Edisi 12.

**Total RAB 2 Tahun Rp. 83,878,000**

**Tahun 1 Total Rp. 0**

**Tahun 2 Total Rp. 83,878,000**

Jenis Pembelanjaan	Item	Satuan	Vol.	Biaya Satuan	Total
Analisis Data	Biaya analisis sampel	Unit	93	100,000	9,300,000
Bahan	ATK	Paket	10	327,000	3,270,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Biaya seminar internasional	Paket	1	10,000,000	10,000,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Biaya Publikasi artikel di Jurnal Nasional	Paket	2	6,500,000	13,000,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Publikasi artikel di Jurnal Internasional	Paket	2	8,750,000	17,500,000
Pelaporan, Luaran Wajib, dan Luaran Tambahan	Biaya konsumsi rapat	OH	4	150,125	600,500
Pengumpulan Data	HR Pembantu Peneliti	OJ	15	63,500	952,500
Pengumpulan Data	Penginapan	OH	32	125,000	4,000,000
Pengumpulan Data	Biaya konsumsi	OH	32	125,000	4,000,000
Pengumpulan Data	Transport	OK (kali)	36	500,000	18,000,000
Pengumpulan Data	Uang Harian	OH	93	35,000	3,255,000

## 6. HASIL PENELITIAN

**A. RINGKASAN:** Tuliskan secara ringkas latar belakang penelitian, tujuan dan tahapan metode penelitian, luaran yang ditargetkan, serta uraian TKT penelitian.

Tujuan dari penelitian ini adalah Menganalisis tingkat efisiensi finansial, efisiensi ekonomi, keunggulan kompetitif dan komparatif (daya saing) kemitraan ayam pedaging di Provinsi Sulawesi Utara secara statis dan dinamis berbasis biaya sumberdaya domestik dalam upaya meningkatkan produksi dan konsumsi pangan hewani melalui pengembangan agribisnis perunggasan di Sulawesi Utara. Pengukuran tingkat efisiensi dan daya saing agribisnis kemitraan ayam pedaging menggunakan metode analisis PAM (Policy Analysis Matrix) dan analisis sensitivitas. Lokasi penelitian dipilih secara purposive yaitu Kabupaten Minahasa Utara dan Kabupaten Minahasa dengan populasi ternak ayam pedaging terbesar dan merupakan sentra produksi ayam pedaging di Sulawesi Utara.. Penelitian ini menggunakan dua tahapan penelitian yaitu pada tahun pertamamelakukan identifikasi karakteristik peternak, perusahaan mitra dan pedagang/pemotong, melakukan analisis statis dengan PAM (Polycy analysis matrix) meliputi identifikasi terhadap berbagai input (tradable dan domestik) dan output usaha kemitraan ayam pedaging, analisis efisiensi, analisis daya saing, dan analisis distorsi kebijakan dan kegagalan pasar serta dampaknya terhadap output dan input (tradable dan domestik). Tahapan selanjutnya pada tahun kedua adalah melakukan analisis sensitivitas (dinamis) secara parsial dari masing - masing dari faktor harga pakan, harga daging ayam dan nilai tukar rupiah serta berbagai kombinasi ketiga faktor tersebut secara simultan terhadap tingkat efisiensi dan daya saing kemitraan ayam pedaging di Sulawesi Utara. Penelitian menggunakan metode survey untuk memperoleh dan mengumpulkan informaasi dari 58 sampel responden di Kabupaten Minahasa Utara yang terdiri atas 53 peternak , 3 perusahaan mitra dan 2 pedagang besar yang dipilih secara acak serta 34 peternak sampel , 3 perusahaan mitra dan 2 pedagang besar yang dipilih secara acak di Kabupaten Minahasa Pada tahun pertama dilakukan identifikasi karakteristik dari peternak mitra, perusahaan mitra serta pedagang besar, penentuan tingkat efisiensi dan daya saing kemitraan ayam pedaging dengan metode Policy Analysis Matrix (PAM). Pada tahun kedua dilanjutkan dengan penentuan tingkat efisiensi dan daya saing kemitraan ayam pedaging melalui analisis sensitivitas harga pakan harga daging ayam dan nilai tukar rupiah. Luaran yang ditargetkan setiap tahun berupa publikasi di Jurnal internasional dan publikasi dalam prosiding internasional. Tingkat kesiapterapan teknologi (TKT) penelitian ini selama 2 tahun antara 2-3. Hasil penelitian bahwa kemitraan ayam pedaging di Provinsi Sulawesi Utara merupakan usaha yang efisien dari sisi finansial maupun ekonomi. Profitabilitas skala usaha  $\leq 5000$  ekor lebih rendah dari pada skala usaha  $> 5000$  ekor karena perbedaan faktor ekonomis dan teknis. Profitabilitas privat yang lebih rendah daripada profitabilitas social menunjukkan bahwa kemitraan ayam pedaging di Poivinsi Sulut menanggung harga input yang lebih mahal dan harga output yang lebih murah daripada harga sosialnya.. Kemitraan ayam pedaging memiliki daya keunggulan kompetitif dan komparatif yang ditunjukkan masing masing oleh nilai PCR sebesar 0,94-0,97 dan DRCCR sebesar 0,80-0,83. Hal ini berarti bahwa untuk mendapatkan nilai tambah atau menghemat satu satuan devisa dalam memproduksi daging ayam memerlukan biaya sumberdaya domestik sebesar 0,94-0,97 US\$ pada harga privat dan 0,80-0,83 US\$ pada harga social. Perubahan harga pakan mencapai harga efisiensinya, perubahan harga ayam pedaging pada harga efisiensinya dan apresiasi nilai tukar rupiah terhadap dollar amerika meningkatkan efisiensi dan daya saing kemitraan ayam pedaging di Kabuaten Minahasa Utara. Luaran yang diperoleh berupa publikasi di journal Business Management (Sudah publikasi tahun 2019) pemakalah pada seminar internasional ICVHE 2019, Publikasi pada Journal of Agricultural Sciences–Sri Lanka (INDEXED SCOPUS, Status In Review) serta pemakalah oral pada Internasional Conference on Agribusiness and Rural Development (ICONARD) 2020 pada tanggal 13-14 Oktober

2020 ( (Status In Review) untuk proses publikasi di E3S web of conference (SCOPUS Indexed)

**B. KATA KUNCI:** Tuliskan maksimal 5 kata kunci.

Efisiensi, daya saing, kemitraanayam pedaging, Policy Analysis Matrix, analisis sensitivitas

Pengisian poin C sampai dengan poin H mengikuti template berikut dan tidak dibatasi jumlah kata atau halaman namun disarankan seringkas mungkin. Dilarang menghapus/memodifikasi template ataupun menghapus penjelasan di setiap poin.

**C. HASIL PELAKSANAAN PENELITIAN:** Tuliskan secara ringkas hasil pelaksanaan penelitian yang telah dicapai sesuai tahun pelaksanaan penelitian. Penyajian dapat berupa data, hasil analisis, dan capaian luaran (wajib dan atau tambahan). Seluruh hasil atau capaian yang dilaporkan harus berkaitan dengan tahapan pelaksanaan penelitian sebagaimana direncanakan pada proposal. Penyajian data dapat berupa gambar, tabel, grafik, dan sejenisnya, serta analisis didukung dengan sumber pustaka primer yang relevan dan terkini.

Pengisian poin C sampai dengan poin H mengikuti template berikut dan tidak dibatasi jumlah kata atau halaman namun disarankan ringkas mungkin. Dilarang menghapus/memodifikasi template ataupun menghapus penjelasan di setiap poin.

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## HASIL PENELITIAN YANG DICAPAI

### Karakteristik Responden

#### Umur peternak

Berdasarkan kategori umur (Tabel 1) diketahui bahwa usaha peternakan ayam ras pedaging kebanyakan dikelola oleh peternak kelompok umur antara 41-50 tahun sebanyak 33 orang, (37,68%) lebih dari 50 tahun 25 peternak (28,99%) selanjutnya 30-40 tahun sebanyak 23 orang peternak (24,64%), dibawah 30 tahun sebanyak 8 orang. (8,70%). Hasil tersebut menunjukkan bahwa usaha ayam pedaging dikelola oleh peternak yang berada pada usia produktif.

**Tabel 1. Usia Peternak Sampel**

No.	Usia Peternak (Tahun)	Jumlah (Orang)	Persentasi (%)
1	< 30	8	8,70
2	30-40	23	24,64
3	41-50	33	37,68
4	>50	20	28,99
	Jumlah	87	100

Kemampuan seseorang akan meningkat sampai umur tertentu kemudian mengalami penurunan. Umur peternak akan mempengaruhi fisik, [pikiran dan mental. Peternak berumur muda mempunyai kemampuan fisik lebih kuat dan waktu erja yang lebih lama dibandingkan dengan yang berumur lebih tua. Selain itu umur juga mempengaruhi kemampuan peternak dalam menerima, memahami dan menerapkan ilmu pengetahuan dan teknologi yang menyangkut usaha peternakannya.

#### Pendidikan peternak

Pada Tabel 2 tampak bahwa tingkat pendidikan peternak kemitraan ayam ras pedaging di Provinsi Sulawesi Utara bervariasi antara SD, SMP, SMU sampai Perguruan

Tinggi. Tingkat pendidikan peternak terbesar adalah SMU sebanyak 38 orang (43,48%), SMP 31 orang (36,23%), PT 14,49% ( 13 orang) dan terkecil pendidikan SD sebanyak 5 peternak (5,08%).

**Tabel 2. Pendidikan Peternak**

No.	Pendidikan Peternak	Jumlah (Orang)	Persentasi (%)
1	SMU	38	43,48
2	SMP	31	36,23
3	PT	13	14,49
4	SD	5	5,08
	Jumlah	87	100

Tingkat pendidikan peternak mempengaruhi cara peternak berfikir dan tingkat penerimaan mereka terhadap inovasi dan teknologi. Semakin tinggi tingkat pendidikan peternak maka akan semakin baik kualitas sumberdaya manusia yang pada gilirannya akan semakin baik pada produktivitas kerjanya

#### **Pengalaman peternak**

Pengalaman usaha menunjukkan lama peternak menjalankan usaha peternakan ayam pedaging . Pengalaman peternak yang terlama adalah pada interval 11-15 tahun sebanyak 29 peternak ( 33,33 %), kemudian 6-10 tahun 28,99% ( 25 orang), selanjutnay sebanyak 20 orang peternak (23,19%) memiliki pengalaman berusaha ayam pedaging lebih dari 16 tahun dan kurang dari 5 tahun sebanyak 13 orang (14,49%).

Pengalaman merupakan suatu pengetahuan yang diperoleh peternak melalui rutinitas kegiatan sehari hari atau peristiwa peristiwa yang dialami. Jika peternak mempunyai pengalaman yang relative lama dalam mengelola usahanya, umumnya akan memiliki pengetahuan, sikap dan keterampilan yang lebih baik jika dibanding dengan peternak yang kurang pengalaman. Pengalaman berusaha membantu peternak dalam pengambilan keputusan usaha dan memudahkan peternak mengatasi permasalahannya

#### **5.3.4. Skala Usaha**

Skala usaha dilihat dari jumlah DOC yang dipelihara peternak pada setiap periode produksi. Skala usaha merupakan salah satu syarat peternak untuk menjalin kemitraan dan besarnya disesuaikan dengan kapasitas kandang . Sebanyak 49 peternak ( 56,52%) memiliki skala usaha kurang dari 5000 ekor dan 38 orang (43,48%) memiliki skala usaha lebih dari 5000 ekor (Tabel 3). Rata rata skala usaha peternak sebanyak 5243 ekor dengan sebaran 1500

ekor sampai dengan 14400 ekor per periode. Luas kandang yang dimiliki peternak antara 188-1800 m<sup>2</sup> dengan kepadatan rata rata 8 ekor/m<sup>2</sup>.

Besarnya skala usaha dipengaruhi oleh kemampuan ekonomi, pengalaman peternak, maupun kerjasama usaha yang dijalin peternak. Peningkatan skala usaha berkaitan dengan kemitraan yang dijalin peternak dengan perusahaan mitra. Penelolitian Siswoyo (2002) menunjukkan bahwa peternak kemitraan di Kabupaten Malang memiliki skala usaha rata rata 6583 ekor, sedangkan peternk mandiri hanya 1760 ekor. Bahari (2010) melaporkan bahwa skala usaha pola kemtraan disebabkan sebagian besar biaya produksi seperti pakan, DOC, dan obat obatan disediakan oleh perusahaan mitra sedangkan peternak hanya menyediakan sebagian kecil biaya untuk pembuatan sewa kandang, peralatan, lahan dan tenaga kerja

**Tabel 3. Skala Usaha Peternak**

No.	Skala Usaha (Ekor)	Jumlah (Orang)	Persentasi (%)
1	≤ 5000	49	56,52
2	≥ 5000	38	43,38
	Jumlah	87	100,00

#### **Perusahaan Mitra**

Kemitraan ayam oedaging di Provinsi Sulawesi Utara berkembang dan mengalami pasang susrut seiring dengan kebijakan pemerintah. Saat ini terdapat 6 perusahaan mitra di Kabupaten Minahasa utara dan Kabupaten Minahasa sebagai sentra produksi ayam pedaging di Sulawesi Utara yang menjalin kemitraan dengan 975 peternak plasma dengan populasi 7,6 juta ekor (Dinas Pertanian dan Peternakan Provinsi Sulut, 2018), dimana sebanyak 3 perusahaan diantaranya merupakan responden dalam penelitian ini. Kelima Prusahaan mitra adalah Charoen Pokphand Jaya Farm, Ciomas Adi Satwa, Cipendawa Fatrm Enterprise.

Berdasarkan hak dan kewajiban perusahaan mitra (Inti) dan peternak mitra (Plasma) maka kemitraan ayam pedaging di Sulawesi Utara dilaksanakan dengan pola kerjasama operasional agribisnis (KOA) dimana perusahaan mitra berkewajiban menyediakan sarana produksi (DOC, pakan, obat, , vaksin dan desinfektan, bimbingan teknis, dan pemasaran hasil, sedangkan peternak mitra melaksanakan kegiatan budidaya dengan menyediakan kandang, , peralatan dan tenaga kerja. Pola KOA member manfaat pada peternak mitra antara lain (1) stabilitas pendapatan, (2) peningkatan efisiensi melalui bimbingan teknis, manajemen dan akses teknologi (3), keamanan pasar berkaitan dengan standar produk, waktu panen, dan jaminan harga dan (4) akses terhadap capital lebih mudah karena

sebagian besar sarana produksi dipenuhi oleh perusahaan mitra. Bagi perusahaan diperoleh manfaat berupa stabilitas produksi dan jaminan kontinuitas supply, efisiensi dan kinerja perusahaan meningkat, perluasan pasar dan memperkuat posisi persaingan di pasar, memperluas kesempatan ekspansi dan diversifikasi operasional perusahaan.

### **Pedagang pemotong**

Pemasaran ayam pedaging dari peternak ke konsumen di Sulawesi Utara maupun konsumen di daerah lainnya melibatkan beberapa lembaga pemasaran yaitu pedagang pengumpul, pedagang pemotong, pedagang pemotong pengecer, dan pedagang pengecer. Pedagang pemotong adalah lembaga pemasaran yang melakukan kegiatan pembelian ayam hidup dari pedagang pengumpul untuk dijual kembali dalam bentuk karkas.

Pada penelitian ini yang dijadikan responden adalah pedagang pemotong yang membeli ayam hidup dari perusahaan mitra untuk kemudian dipotong dan dijual kembali dalam bentuk karkas, baik melalui pedagang pengecer, ke pasar modern, hotel, restoran maupun di luar daerah. Pedagang pemotong ini memiliki rumah pemotongan ayam kelas C yaitu usaha pemotongan ayam yang menyediakan kebutuhan daging ayam antar Kabupaten Kota dalam provinsi Sulut dengan wilayah pemasaran Kabupaten Minahasa Utara, Kabupaten Minahasa, Kabupaten Minahasa Selatan, Kota Manado hingga kota Bitung. Berdasarkan pertimbangan bahwa pedagang pemotong memiliki kapasitas potong minimal 1000 ekor per hari dan sudah beroperasi lebih dari 3 tahun maka dipilih 2 pedagang pemotong di setiap wilayah penelitian. Karakteristik pedagang pemotong adalah mulai beroperasi tahun 2010 dengan investasi berkisar antara Rp 550.000.000 sampai dengan Rp. 875.000.000 dengan kapasitas potong perhari sebesar 1250 ekor -1500 ekor dengan produksi karkas 1625 kg sampai dengan 1950 kg/hari. Hasil penelitian menunjukkan bahwa jumlah tenaga kerja yang digunakan di kedua rumah potong ayam sebanyak 15 dan 20 orang

### **Policy Analysis Matrix (PAM) Pada Kemitraan Ayam Pedaging Di Provinsi Sulawesi Utara**

#### **Identifikasi input dan output**

Jika ditinjau dari sisi teknis jumlah produksi yang dihasilkan produsen ditentukan oleh penggunaan input tenaga kerja, modal, bahan baku, lahan, skala ekonomi dan parameter efisiensi (Saptana, dkk, 2003). Input yang digunakan dalam proses produksi dapat dipisahkan menjadi (a) Tradable goods, dan (b) domestic factor (non tradable goods). Input yang pada kategori pertama adalah input yang dapat diperdagangkan dipasar internasional sedangkan input kategori kedua adalah input yang tidak dapat diperdagangkan dipasar



internasional. Pada peternakan ayam pedaging bahan baku berupa sarana produksi yang digunakan seperti bibit ayam (DOC), akan, obat, vaksin, dan desinfektan serta saponak lainnya,. Unang (2005) menyebutkan bahwa komponen input tradable pada produksi ayam pedaging adalah DOC, pakan , OVD (Obat, vitamin, vaksin dan desinfektan) dan bahan bakar pemanas. Sedangkan faktor domestic terdiri atas biaya tenaga kerja, , modal dan sewa lahan..Komponen input untuk peternakan ayam pedaging di Sulawesi Utara disajikan pada Tabel 4.

Tabel 4. Input Output Produksi Kemitraan Ayam Pedaging

<b>Input/output</b>	<b>Satuan</b>	<b>Skala ≤ 5000 ekor</b>	<b>Skala &gt;5000 ekor</b>
<b>Input Tradable</b>			
DOC	ekor	17.014	31.686
Pakan	Kg	56.505	101.723
OVD	Unit	189	194
Gas	Kg	893	1.664
<b>Faktor Domestik</b>			
Tenaga Kerja	Rp/ekor hidup	300	300
Listrik	KwH	608	1.132
Sekam	Rp/ekor	250	250
Lahan	M2	697	1.506
Modal investasi	Rp/tahun	5.504.718	11.886.344
Kandang	M2	436	941
Pemanas	Unit	4	8
Tempat pakan	Unit	117	251
Tempat minum	Unit	59	126
Lain lain	Rp/ekor	150	150
<b>Output</b>			
Pengangkutan, pemotongan dan pemnasaran	Rp/kg	1000	1000
Ayam hidup	Ekor	15.714	29.899
Ayam hidup	Kg	31.093	59.319
Karkas	Kg	21.765	41.523

Jumlah DOC yang dipelihara peternak bervariasi antara 1.500-14.400 ekor menyesuaikan dengan kapasitas kandang, dengan rata rata 3.486 ekor per periode produksi (17.014 ekor/ tahun) untuk skala ≤ 5.000 ekor) dan 7.528 ekor per periode (31.686 ekrr /tahun) untk, peternak dengan skala pemilihan > 5.000 ekor). Skala pemilikan ini sdikit berbeda dengan penelitian Siswoyo (2002) dan Bahari (2010) yang menyebutkan sebaran DOC peternak plasma di Kabupaten Malang antara 2.500 -12.000 ekor dan 2.000 -12.000 ekor. Rata rata jumlah pakan yang dihabiskan sebanyak 56.505 kg per tahun untuk peternak skala ≤ 5.000

ekor dan 101 723 kg untuk skala > 5.000 ekor. Peternak umumnya menggunakan tenaga kerja pria, baik tenaga keluarga maupun tenaga yang disewa. Jumlah TK yang dipekerjakan 1-2 orang untuk 5.000 ekor ayam. Pekerjaan yang dilakukan antara lain pembersihan kandang, kebersihan lingkungan (biosekuriti), pencucian peralatan, dan persiapan masuknya DOC, pemeliharaan meliputi pemberian pakan dan minum, vaksinasi, desinfeksi, dan pengobatan, pengaturan pemanas, dan traik kandang, serta yang terakhir adalah pekerjaan saat panen dan pengangkutan.

Peternak memelihara ayam sebanyak 2-6 siklus produksi dengan rata-rata 5 siklus untuk peternak skala  $\leq$  5.000 ekor dan 4 siklus untuk peternak skala > 5.000 ekor dalam satu tahun. Satu siklus produksi adalah masa pemeliharaan ayam DOC sampai umur panen antara 32-47 hari. Ayam dipanen dengan bobot antara 1,54 -2,29 kg/ekor dengan konversi pakan 1,62-2,06. Selama satu siklus produksi jumlah ternak yang dipanen 94% atau tingkat mortalitas 6%, lebih tinggi dari mortalitas standar 4,5%. Mortalitas tersebut sama dengan penelitian Zalizar dan Rahayu (2000) juga Siswoyo (2000).

### **Harga Privat dan Harga Sosial Input dan Output**

Harga privat untuk komoditi tradable baik input maupun output dan barang-barang impor maupun ekspor diperoleh dari harga pasar (aktual) pada tingkat peternak sedangkan harga sosial untuk produk-produk tersebut adalah border price (harga impor untuk importables, dan harga ekspor untuk exportables). Harga pasar untuk input dan output ditingkat peternak adalah harga kontrak yang telah disepakati antara Perusahaan mitra dan peternak mitra. Harga sosial (harga efisiensi) untuk tradable goods adalah harga internasional untuk barang sejenis (Comparable) yang merupakan ukuran social opportunity of cost yang terbaik bagi barang-barang tersebut.

Perhitungan harga sosial untuk non tradable goods berbeda dengan barang tradable. Harga privat untuk non tradable diambil dari harga pasar pada tingkat peternak seperti pada barang tradable, namun tidak ada harga dunia untuk non tradable yang bisa digunakan sebagai harga efisiensi. Harga sosial untuk barang non tradable diestimasi dengan mengurangkan divergensi yang terjadi baik karena distorsi kebijakan maupun kegagalan pasar dari harga privatnya. Bila dampak divergensi tidak bisa diestimasi, langkah berikutnya adalah mencari harga barang substitusinya untuk digunakan sebagai Proxy dari harga sosial barang-barang non tradable. Tabel 5 merangkum harga privat dan sosial input dan output kemitraan ayam pedaging di Provinsi Sulawesi Utara.

**Tabel 5. Harga Privat dan Sosial Input Output Kemitraan Ayam Pedaging**

Komponen	Satuan	Skala ≤ 5.000 ekor		Skala > 5.000 ekor	
		Privat	Sosial	Privat	Sosial
<b>Tradable Input</b>					
DOC	Rp/ekor	4.671	4.671	4.465	4.465
Pakan	Rp/ekor	4.901	4.741	5.208	5.038
OVD	Rp/unit	48.022	46.548	62.432	60.516
Gas	Rp/kg	4.500	6.250	4.500	6.250
<b>Faktor Domestik</b>					
Tenaga Kerja	Rp/ekor	300	300	300	300
Listrik	Rp/KwH	420	1.163	420	1.163
Sekam	Rp/ekor	250	250	250	250
Lahan	Rp/M2	1.500	1.500	1.500	1.500
Bunga Bank	%/tahun	12,1	12,1	12,1	12,1
CR Kandang	Rp/ekor	883	883	883	883
CR Pemanas	Rp/ ekor	70	70	70	70
CR Tempat makan	Rp/ ekor	209	209	209	209
CR Tempat minum	Rp/ ekor	417	417	417	417
Pengangkutan, pemtongan dan pemasaran	Rp/ ekor	1.000	1.000	1.000	1.000
Lainnya	Rp/ ekor	150	150	150	150
<b>Output</b>					
Ayam hidup	Rp/kg	11.912	11.912	12.504	12.504
Karkas	Rp/kg	19.733	24.220	19.674	24.220

### Harga Input Tradable

#### DOC (Day old Chick)

Pada periode awal perintisan usaha bibit ayam ras adalah komoditi impor (final stock/FS). Ayam ini dibibitkan hingga menghasilkan anak anak ayam turunan pertama (F1) , turunan kedua (F2) dan seterusnya. Pada penelitian ini harga social DOC FS dihitung sama dengan harga kontrak yaitu Rp 9.671/ekor untuk skala ≤ 5.000 dan Rp 9.565/ ekor untuk skala > 5.000 ekor dengan pertimbangan bahwa bibit ayam pedaging FS sudah bisa dipenuhi dari produksi dalam negeri sejak pemerintah melarang impor DOC tahun 1984. Pertimbangan kedua adalah kemungkinan adanya Collusive Price diantara industry ayam pedaging di Indonesia sangat kecil. (Wiyono, 2006). Fluktuasi permintaan DOC tidak mendorong terjadinya kolusi antara perusahaan pembibitan baik pada kondisi permintaan tinggi maupun rendah ataupun sebaliknya.

#### Pakan dan OVD (Obat, vaksin deinfektan)

Pakan dan OVD merupakan dua jenis input yang mengandung komponen asing. Tangenjaya dkk (2002) mengatakan bahwa komponen terbesar dalam pakan ternak ayam ras adalah jagung 51,4% diikuti oleh bungkil kedelai 18,0%, dedak/bekatul 15,0%, pollard 10%, tepung ikan 5% dan feed supplement 0,5%. Pasokan bahan pakan sebagian besar masih tergantung pada impor seperti jagung mencapai 40-50%, bungkil kedelai 95%, tepung ikan 90%-92%, tepung tulang dan vitamin hamper 100% diimpor ( Saptana dan Rusastra, 2001). Komponen utama pakan ayam adalah jagung dari sekitar 30 jenis bahan baku yang digunakan dengan tingkat penggunaan berkisar 45-55%. Penggunaan jagung yang dominan ini disebabkan oleh harganya yang relative murah, kalorinya tinggi, protein dengan asam amina yang lengkap, mudah diproduksi dan digemari oleh ternak. Hasil perhitungan harga social pakan dan OVD menghasilkan harga Rp. 9.870/kg pakan dan Rp 68.621/unit OVD

### **Gas**

Peternak menggunakan gas sebagai bahan bakar pemanas (brooder) menggantikan minyak tanah. Gas yang digunakan adalah gas bersubsidi pada tabung 3 kg seharga Rp. 4.500/kg. Harga social gas menggunakan standar harga gas tanpa subsidi sebesar Rp. 6.500/kg. Tingkat komponen dalam negeri pemakaian gas tahun 2017 sebesar 63,4% (Kementerian ESDM, 2018). Realisasi tersebut melebihi TKDN tahun 2010 yang ditargetkan berdasarkan cetak biru Kementerian ESDM sebesar 55 persen.

### **Harga Faktor Domestik**

#### **Tenaga Kerja**

Hasil penelitian menunjukkan hamper semua tenaga kerja yang digunakan pada usaha budidaya ayam pedaging adalah tenaga kerja unskill (tidak terampil). Hasil ini sesuai dengan hasil penelitian yang dilakukan pada berbagai usaha tani di daerah di Indonesia (Pearson, dkk, 2011). Upah tenaga kerja privat untuk semua kategori tenaga kerja tidak terampil di pedesaan dapat digunakan sebagai oenduga yang baik untuk upah sosialnya. Tingkat upah privat tenaga kerja diketahui Rp.600/ayam hidup. Tingkat upah tersebut juga erupakan tingkat upah social tenaga kerja.

#### **Modal investasi**

Perhitungan Capital Recovery Cost (CRC) dari kandang dan asset tetao didasarkan pada informasi tentang biaya pemulihan modal dari sebuah investasi termasuk investasi bangunan kandang, , alat, umur ekonomis, dan nilai sisa. Umur ekonomis bangunan kandang dioerkirakan 10 tahun sedangkan alat pemanas dan alat lainnya 5 tahun dan 3 tahun

(Unang, 2013). Berdasarkan penelitian diperlukan biaya investasi awal untuk kandang sebesar Rp. 6.500/ekor, pemanas Rp.500/ekor, tempat makan Rp.600/ekor, tempat minum Rp. 1300/ekor. Berdasarkan umur ekonomis, nilai sisa dan tingkat bunga diperoleh biaya pemulihan modal per tahun untuk kandang Rp.1200/ekor, pemanas Rp.110/ekor, tempat pakan Rp.275/ekor, dan tempat minum Rp 585/ekor

### **Lahan Sewa**

Jika lahan berfungsi sebagai faktor produksi maka harga dan nilainya harus mencerminkan kegunaannya dalam menghasilkan sesuatu yaitu nilai produksi bersih lahan tersebut selama jangka waktu tertentu sedangkan jika lahan tersebut disewakan maka harga sewanya dapat dianggap mencerminkan nilai lahan tersebut (Soetrisno, 2006). Gittinger (2008) menaksir harga bayangan lahan dengan menggunakan sewa yang diperhitungkan tiap musim. Pada penelitian ini harga social lahan diperhitungkan sama dengan harga sewa aktualnya yaitu Rp. 2.500/m<sup>2</sup>.

### **Listrik**

Kebutuhan listrik pada usaha peternakan ini tergolong pelanggan golongan R1 dengan daya 900 VA. Jumlah pemakaian listrik rata-rata perbulan 70 kWh dengan tariff bersubsidi Rp. 1.400/kWh. Harga social tariff listrik diperhitungkan tariff tanpa subsidi sebesar biaya pokok produksi listrik yaitu Rp. 3.863/kWh. TKDN untuk pembangkit listrik di Sulawesi Utara, tengah dan Gorontalo adalah sebesar 44% (Depperin, 2016).

### **Harga Nilai Tukar**

Harga social nilai tukar rupiah ditetapkan berdasarkan pendekatan standart confersion factor (SCF) yaitu membandingkan semua nilai impor dan ekspor dengan nilai berdasarkan harga domestik. Nilai tukar bayangan (SER) adalah perbandingan antara nilai tukar resmi dengan SCF. Hasil analisis penelitian menunjukkan bahwa nilai SCF sebesar 0,99 dan nilai SER 9,163

### **Harga Output**

Harga yang digunakan untuk mengukur harga social output adalah harga batas karena sebagian daging ayam adalah komoditas impor. Pada penelitian ini harga social output yang digunakan adalah harga cif daging ayam impor dari Amerika Serikat. Data BPS (2018) bahwa selama 2013-2017 Indonesia mengimpor daging ayam sebanyak 7.488 ton senilai 11.459.193 US\$. Kedalam harga cif kemudian ditambahkan biaya transport dan pemasaran

samoai ke pedagang besar di Kabupaten Minut dan Minahasa sehingga dioeroleh harga social daging ayam sebesar Rp 24.220/kg. Harga social daging ayam lebih mahal jika dibandingkan dengan harga aktual Rp 22.427/kg

### Anggaran Privat dan Anggaran Sosial

Anggaran privat dan anggaran social diperoleh dengan mengalikan kuantitas input dan output pada Tabel 7 dengan harga harga privat dan harga social pada Tabel 8. Srtuktur biaya privat produksi daging ayam di Provinsi Sulawesi Utara tahun 2019 sebesar Rp. 618.170.354 (Rp. 22.154/kg) utuk skala  $\leq 5.000$  ekor dan Rp 932.988.826 (Rp.20.435/Kg) sedangkan biaya sosialnya masing masing Rp.587.200.661 (21.645/kg) dan Rp. 897.147.995 (Rp20. 104/kg). Biaya privat usaha ayam pedaging pada kedua skala lebih mahal dobanding biaya sosialnya karena peternak mennggung haega privat pakan Rp. 4.901-5.208/kg lebih mahal dari biaya social pakan Rp. 4.741-5.038/kg

Jika diuraikan berdasarkan sifatnya sebagian besar (87-88%) biaya berasal dari input tradable seperti DOC, pakan, , OVD, dan gas, sedangkan 12-13% peralatan, sewa lahan, bunga modal, sekam , pemotongan, dan pengangkutan (Tabel 6).

**Tabel 6. Biaya Input kemitraan ayam pedaging di Sulawesi Utara**

Komponen	Tradable Input (Rp/Tahun)	Non Tradable input(Rp/Tahun)	Total Biaya (Rp/Tahun)
Skala $\leq 5.000$ ekor Privat	568.752.114	49.418.240	618.170.354
Skala $\leq 5.000$ ekor Sosial	537.330.944	49.869.717	587.200.661
Skala $> 5.000$ ekor Privat	837.405.419	95.583.407	932.988.826
Skala $> 5.000$ ekor Sosial	800.723.760	96.424.235	897.147.995

Jika diuraikan berdasarkan komponen asing dan domestic, di dalam input tradable maupun non tradable terdapat komponen asing sebanyak 41-42% dan 58-59% komponen domestic (Tabel 7)

**Tabel 7. Biaya Kopmponen Asing Dan Domestik**

Komponen	Komponen asing (Rp/Tahun)	Komponen domestik input(Rp/Tahun)	Total Biaya (Rp/Tahun)
Skala $\leq 5.000$ ekor Privat	253.449.845	358.538.805	618.170.354
Skala $\leq 5.000$ ekor Sosial	246.624.278	346.448.390	587.200.661

<b>Skala &gt; 5.000 ekor Privat</b>	391855.307	541.133.519	932.988.826
<b>Skala &gt; 5.000 ekor Sosial</b>	376.802.158	520.345.837	897.147.995

Berdasarkan penggunaannya sebagian besar ( 66-68%) biaya produksi tersebut digunakan untuk pakan sedangkan sisanya adalah untuk DOC 17-19%, pemotongan dan pemasaran 7-8%, OVD 1-2 %, dan tenaga kerja 1%. Hasil ini berbeda dengan Saptana dan Rusastra (2001) di Bogor dan Tasikmalaya bahwa biaya Rnsun Ayam berkisar antara 50-65%, Yunus (2009) di Palu bahwa biaya pakan 73,54% dan Bahari (2010) di Malang bahwa biaya pakan peternak kemitraan mencapai 77,39%.

### **Analisis Efisiensi**

Tingkat efisiensi ditunjukkan oleh indikator keuntungan privat dan keuntungan social . Keuntungan merupakan selisih antara penerimaan dengan biaya. Pada analisis PAM keuntungan adalah Excess profit atau return to management yaitu nilai lebih setelah semua biaya diperhitungkan . Apabila suatu sistem agribisnis memperoleh keuntungan privat positif , berarti agribisnis mampu bersaing pada tingkat harga aktual dimana termasuk didalamnya dampak distorsi kebijakan dan kegagalan pasar. . Daya saing tidak hanya berkaitan dengan pihak produsen hasil hasil pertanian tetapi juga pengambil kebijakan sektor pertanian . Lebih dari itu daya saing juga menjadi perhatian pengambil kebijakan yang terkait dengan pengembangan investasi dalam rangka meningkatkan pertumbuhan ekonomi.

Hasil analisis menunjukkan bahwa keuntungan privat peternak pada kedua skala lebih rendah daripada penerimaan sosialnya. Hal ini disebabkan peternak memperoleh harga privat karkas Rp. 19.733-Rp.19.674/kg lebih murah daripada harga sosialnya Rp.24.220/kg. Selisih penerimaan dan biaya memberikan keuntungan privat pada kemitraan ayam pedaging di Provinsi Sulawesi Utara sebesar Rp. 8.689.809 untuk skala  $\leq$  5.000 ekor dan Rp. 27.186.579 untuk skala  $>$  5.000 ekor (Tabel 8)

**Tabel 8. Biaya Penerimaan dan Keuntungan**

<b>Komponen</b>	<b>Biaya (Rp/Tahun)</b>	<b>Penerimaan (Rp/Tahun)</b>	<b>Keuntungan (Rp/Tahun)</b>
<b>Skala <math>\leq</math> 5.000 ekor Privat</b>	618.170.354	609.480.545	8.689.809
<b>Skala <math>\leq</math> 5.000 ekor Sosial</b>	587.200.661	563.230.613	50.970.048
<b>Skala &gt; 5.000 ekor</b>	932.988.826	905.802.247	27.186.579

Privat			
<b>Skala &gt; 5.000 ekor Sosial</b>	897.147.995	785.168.594	111.979.401

Tabel 8 menunjukkan bahwa skala usaha > 5.000 ekor lebih menguntungkan dari pada skala  $\leq$  5.000 ekor. Hal ini disebabkan oleh faktor ekonomis dan faktor teknis. Dilihat dari faktor ekonomis, peternak skala usaha  $\leq$  5000 memperoleh harga input pakan dan OVD dan harga output lebih murah daripada peternak skala usaha > 5.000 ekor. Hal ini terjadi karena penentuan harga kontrak input tidak mempertimbangkan skala usaha peternak, melainkan dengan pertimbangan harga input dari pabrik. Sedangkan penentuan harga output ayam hidup mempertimbangkan efisiensi teknis yang dicapai oleh peternak. Ditinjau dari sisi teknis peternak skala  $\leq$  5000 ekor menghasilkan nilai konversi pakan, bobot badan dan mortalitas ayam yang lebih jelek dibandingkan peternak dengan skala usaha > 5.000 ekor. Angka konversi pakan, bobot badan dan mortalitas ayam peternak skala usaha > 5.000 ekor masing masing sebesar 1,74, 2,00 kg dan 6,9% sedangkan skala  $\leq$  5000 memiliki nilai teknis masing masing 1,81, 1,99 kg dan 8,21%. Hal ini berarti manajemen usaha skala pemeliharaan > 5.000 ekor lebih baik dibanding skala yang lebih rendah. Harga ayam peternak dengan skala > 5.000 ekor Rp. 12.504/kg lebih mahal dibandingkan dengan harga ayam peternak skala  $\leq$  5.000 ekor sebesar Rp. 11.912/kg. Pada Tabel 11 menunjukkan bahwa keuntungan privat pada semua skala adalah positif yang berarti agribisnis kemitraan ayam pedaging di Sulawesi Utara efisien dan menguntungkan serta mampu berekspansi. Semakin besar skala usaha maka semakin menguntungkan sehingga pemerintah dan perusahaan mitra perlu mendorong peningkatan usaha agar profitabilitas usaha semakin meningkat.

### **Analisis Daya Saing**

Tingkat daya saing ditunjukkan oleh indikator Privat cost ratio (PCR) dan Domestic resource cost ratio (DRCR). PCR adalah indikator keunggulan kompetitif yang menunjukkan kemampuan sistem untuk membayar biaya sumberdaya domestik dan tetap kompetitif pada harga privat, sedangkan DRCR merupakan indikator keunggulan komparatif yang menunjukkan jumlah sumberdaya domestik yang dapat dihemat untuk menghasilkan satu unit devisa (Pearson dkk, 2005). PCR merupakan perbandingan antara biaya faktor domestik dengan nilai tambah output pada harga privat. PCR digunakan untuk mengukur seberapa besar biaya sumberdaya domestik yang dikorbankan untuk memperoleh nilai tambah



sebesar satu satuan devisa apabila suatu komoditas diproduksi didalam negeri dan merupakan pengukiran daya saing dalam perekonomian secara aktual.

Hasil perhitungan PCR menunjukkan bahwa peternak ayam pedaging di Sulawesi Utara memiliki keunggulan kompetitif yang ditunjukkan oleh nilai PCR sebesar 0,97 untuk peternak skala  $\leq 5000$  ekor dan 0,94 untuk skala  $> 5000$  ekor (Tabel 9). Hal ini berarti untuk mendapatkan nilai tambah satu satuan devisa (1 US\$) diperlukan 0,97 US\$ (Rp. 13.895) dan 0,94 US\$ (Rp. 13.465) biaya sumberdaya domestic masing masing untuk peternak skala usaha  $\leq 5000$  ekor dan skala usaha  $> 5000$  ekor

**Tabel 9. Nilai Daya Saing Kemitraan Ayam Pedaging**

Skala Usaha	PCR	DRCR
$\leq 5.000$ ekor	<b>0,97</b>	<b>0,83</b>
$>5.000$ ekor	<b>0,94</b>	<b>0,80</b>

Berdasarkan nilai keunggulan komparatif maka kemitraan ayam pedaging di Sulawesi Utara memiliki nilai DRCR sebesar 0,83 dan 0,80 untuk peternak dengan skala usaha  $\leq 5000$  ekor dan  $> 5000$  ekor. Hal ini berarti bahwa untuk menghemat satu satuan devisa (1 US\$) diperlukan 0,83 US\$ (Rp.11.889) dan 0,80 US\$ (Rp. 11.460) biaya faktor domestic masing masing untuk peternak skala  $\leq 5000$  ekor dan skala usaha  $> 5000$  ekor. . Berdasarkan data tersebut dapat dikatakan bahwa jika daging ayam diproduksi di dalam negeri (Sulawesi Utara) maka akan dapat menghemat devisa daerah (Negara) sebesar 17-20 persen dari biaya impor yang harus dikeluarkan

### **Analisis Distorsi Kebijakan dan Kegagalan Pasar**

#### **Divergensi output**

Divergensi buisa positif yang menyebabkan timbulnya implicit subsidi atau transfer sumberdaya yang menambah keuntungan system atau divergensi negative yang menyebabkan implicit pajak atau transfer sumberdaya yang mengurangi keuntungan system. Hasil analisis diperoleh nilai OT kemitraan ayam pedaging Rp. -34.989.546 untuk skala usaha  $\leq 5000$  ekor dan Rp -70.951.991 untuk skala  $> 5000$  ekor. Nilai OT negative menunjukkan besar kecilnya insentif produsen dan pedagang terhadap konsumen daging ayam masing masing sebesar Rp 34.989.546 dan Rp. 70.951.991. Hal ini berarti bahwa konsumen membeli dan produsen menerima dengan harga yang lebih murah daripada harga yang seharusnya.

Untuk mengukur nilai OT yang bebas nilai mata uang digunakan koefisien proteksi output nominal (NPCO/ net protection coefficient on output). Jika NPCO <1 maka harga domestic lebih rendah dari harga dunia berarti harga domestic di disproteksi. Jika NPCO >1 maka harga domestic lebih tinggi dari harga impor atau ekspor dan jika harga domestic sama dengan harga dunia maka NPCO=1. Hasil penelitian menunjukkan bahwa nilai NPCO untuk kedua skala usaha besarnya 0,92 artinya bahwa harga output aktual (Rp. 19674/kg- Rp. 19733/kg karkas yang diterima oeternak 16% lebih murah daripada harga sosialnya (Rp. 24.220) .

Indikator lain yang digunakan untuk mengukur efisiensi pasar adalah bagian yang diterima oleh peternak (farmer share) dan margin pemasaran . Hasil penelitian berdasarkan data harga ayam pedaging dan karkas di Provinsi Sulawesi Utara tahun 2019 diketahui bahwa margin pemasaran ayam pedaging adalah Rp. 8.230/kg dengan distribusi sebesar 53% (Rp. 4.332) diterima RPA, 30% oleh pengecer (Rp. 2.437), dan 18% (Rp. 1.462) oleh pedagang besar.

Kegagalan pasar dapat dilihat dari transmisi harga daging ayam . Dari data harga ayam pedaging di Sulawesi Utara dan harga daging ayam pada tingkat peternak , harga karkas di tingkat pengecer tahun 2019 diketahui bahwa elastisitas transmisi harga daging ayam pedaging sebesar 0,87 yang berarti bahwa perubahan harga Rp. 100 ditingkat pedagang pengecer diikuti oleh perubahan harga ayam di tingkat peternak Rp. 87

## **Divergensi Input**

### **Input Tradable**

Transfer input (IT) untuk melihat divergensi input yang bebas nilai mata uang digunakan rasio koefisien proteksi input nominal (NPCI/ nominal protection coefficient on input). Rasio ini menunjukkan seberapa besar harga domestic (harga privat) input tradable berbeda dengan harga efisiensinya (harga social). Bila NPCI >1 maka harga domestic input tradable lebih tinggi dari harga input pada tingkat harga dunia. Bila NPCI <1 maka harga domestic lebih rendah dari harga dunia dan sistim seolah olah di subsidi oleh kebijakan yang ada. Jika tidak ada transfer maka harga input domestic tidak berbeda dengan harga dunia, NPCI =1.

Hasil analisis penelitian menunjukkan bahwa nilai IT kemitraan ayam pedaging di Sulawesi Utara Rp. 4.728.338 untuk skala usaha  $\leq$  5000 ekor dan Rp. 8.970.750 untuk, skala usaha > 5000 ekor. . Nilai IT positif bahwa produsen dan pedagang mengeluarkan implicit pajak akibat kebijakan yang ada masing masing sebesar Rp. 4.728.338 dan Rp. 8.970.750 . Nilai IT skala usaha  $\leq$  5000 lebih rendah dibanding skala > 5000 ekor karena penggunaan

input yang lebih rendah yang ditunjukkan oleh angka FCR skala  $\leq 5000$  ekor sebesar 1,81 yang lebih tinggi dari FCR  $> 5000$  ekor sebesar 1,74

### **Faktor Domestik**

Hasil analisis memperoleh nilai faktor Transfer (FT) sebesar Rp. 245.152.335 untuk skala  $\leq 5000$  ekor dan Rp. 242.589.979 untuk skala  $> 5000$  ekor. Nilai FT positif berarti bahwa peternak dan pedagang mengeluarkan implicit pajak akibat kebijakan yang ada atau transfer kepada produsen faktor domestik atau Pemerintah masing masing sebesar sebesar Rp. 245.152.335 dan Rp. 242.589.979. Kebijakan pemerintah pada faktor domestik non tradable seperti listrik, mengakibatkan harga sumberdaya domestik dibayar lebih murah daripada harga sosialnya sedangkan faktor domestik tradable seperti pakan, dan obat obatan lebih mahal dari harga paritas impornya (Tabel 10)

**Tabel 10. Transfer Faktor Berdasarkan Skala Usaha**

<b>Skala</b>	<b>Biaya faktor Privat (Rp/thn)</b>	<b>Biaya faktor social (Rp/thn)</b>	<b>Faktor transfer (Rp/thn)</b>
$\leq 5000$	245.152.335	242.589.979	2.562.355
$> 5000$	456.026.723	451.156.643	4.870.080

### **Divergensi Input Output**

Net transfer (transfer bersih) peternakan ayam pedaging kemitraan di Sulawesi Utara sebesar Rp. -42.280.240 per tahun pada skala  $\leq 5000$  ekor dan -84.792.822 untuk skala usaha  $>5000$  ekor. NT negative menunjukkan besarnya defisit produsen ayam pedaging yang disebabkan kebijakan pemerintah dan ditunjukkan oleh koefisien keuntungan (PC) yaitu rasio keuntungan privat dengan keuntungan social sebesar 0,17 untuk skala  $\leq 5000$  ekor dan 0,24 untuk skala  $> 5000$  ekor. Artinya transfer bersih sebesar diatas menyebabkan keuntungan privat hanya 17% dan 24% dari yang seharusnya. Seandainya tidak ada policy transfer. Nilai NT negative yang cukup besar dan PC rendah menunjukkan jumlah implisit pajak yang dibayar peternakan ayam pedaging setiap tahun. Nilai EPC (effective porotection coefficient) sebesar 0,86 pada kedua skala usaha peternakan ayam pedaging di Sulut berarti bahwa nilai tambah output pada harga privat hanya sebesar 86% dan nilai tambah pada keadaan persaingan sempurna.

### **Analisis Sensitivitas**

#### *Sensitivitas harga pakan*

Analisis sensitivitas perubahan harga pakan aktual Rp. 4.901/kg pada skala  $\leq$  5000 ekor dan Rp. 5.208/kg skala  $>$  5000 ekor menjadi sama dengan harga efisiensinya Rp. 4.742/kg dan Rp.5.038/kg atau menurun 3,24% dan 3,26% sementara faktor lainnya tetap akan meningkatkan efisiensi finansial dan daya saing kemitraan ayam pedaging (Tabel 11 dan 12)

Pada kondisi harga pakan sama dengan harga efisiensinya keuntungan privat meningkat 71,3% pada skala  $\leq$  5000 ekor dan 58,82% pada skala  $>$  5000 ekor. Hal ini berarti hilangnya inefisiensi pemasaran menyebabkan biaya produksi pada kedua skala menurun masing masing sebesar Rp 413/kg dan Rp. 416/kg. Harga pakan yang efisien memperkuat keunggulan kompetitif dimana nilai PCR pada skala  $\leq$  5000 ekor menurun dari 0,97 menjadi 0,93 dan pada skala  $>$  5000 ekor menurun dari 0,94 menjadi 0,91. Hal ini berarti biaya faktor domestic yang diperlukan untuk memperoleh nilai tambah 1 satuan devisa (1US\$) pada masing masing skala usaha menurun \$US 0,04 (Rp. 580) dan 0,03 US\$ (Rp. 435). Transfer input pada kedua skala usaha berubah dari positif Rp. 4.728.338 dan Rp. 8.970.750 menjadi Rp -712 dan Rp. - 1.404.989. Hal ini berarti kemitraan ayam pedaging di Minahasa Utara yang semula dipajaki kemudian memperoleh subsidi sebesar nilai transfer input. Nilai IT negative menyebabkan harga input tradable yang dibeli peternak menjadi lebih murah. Pada analisis NPCL diperoleh nilai 0,996 artinya harga input tradable pada harga domestik 0,4% lebih rendah dari harga sosialnya. Harga pakan yang efisien menyebabkan biaya produksi menjadi lebih rendah dan meningkatkan efisiensi dan daya saing agribisnis ayam pedaging di Kabupaten MinahasaUtara.

**Tabel 11. Sensitivitas Harga Pakan Terhadap PP, IT, FT, NT (Rp/tahun)**

<b>Uraian</b>	<b>Provitabilitas privat (PP)</b>	<b>Transfer input (IT)</b>	<b>Transfer faktor (FT)</b>	<b>Transfer bersih (NT)</b>
Keadaan awal skala $\leq$ 5000	8.689.809	4.728.338	2.562.355	- 42.280.240
Keadaan awal skala $>$ 5000	27.186.579	8.970.750	4.870.080	- 84.792.822
Harga pakan efisien skala $\leq$ 5000	17.757.354	-712.189	-1.064.663	-33.212.695
Harga pakan efisien skala $>$ 5000	44.479.477	-1404.989	-2.047.079	-67.499.924

**Tabel 12 Sensitivitas Harga Pakan Terhadap PP.IT, FT , NT (Rp/kg)**

Uraian	Harga pakan /kg	Provitabilitas privat/kg	Transfer input (IT)/kg	Transfer faktor (FT)/kg	Transfer bersih (NT)/kg
Keadaan awal skala $\leq$ 5000	4.901	579	215	116	-1.818
Keadaan awal skala $>$ 5000	5.208	707	216	117	-1.878
Harga pakan efisien $\leq$ 5000	4.742	992	-33	-49	-1.405
Harga pakan efisien skala $>$ 5000	5.038	1123	-34	-50	-1.462

***Sensitivitas Harga Daging Ayam***

Hasil analisis sensitivitas perubahan harga daging ayam Rp. 19733/kg skala  $\leq$  5000 ekor dan Rp. 19674/kg pada skala  $>$  5000 ekor menjadi sama dengan harga effiensinya Rp. 21220/kg akan meningkatkan efisiensi finansial dan daya saing agribisnis ayam pedaging.. Pada kondisi harga daging ayam sama dengan harga effiensiannya keuntungan privat meningkat sebesar 403% pertahun pada skala  $\leq$  5000 ekor dan 260,98% per tahun pada skala  $>$ 5000 ekor. Hal ini berarti bahwa hilangnya inefisiensi pemasaran daging ayam broiler baik karena distorsi kebijakan ataupun kegagalan pasar menyebabkan keuntungan dari kedua skala meningkat masing masing sebesar Rp. 1487/kg dan Rp. 1546/kg. Nilai PCR yang diperoleh sebesar 0,85 dan 0,94 untuk skala  $\leq$  5000 ekor dan  $>$ 5000 ekor berarti bahwa biaya faktor domestic yang diperlukan untuk memperoleh nilai tambah sebesar 1 US\$ pada kedua skala akan menurun 0,12 US\$.

***Sensitivitas Nilai Tukar***

Analisis ini menggunakan dua kemungkinan nilai tukar dengan basis rata rata nilai tukar resmi tahun 2019. Pertama diasumsikan nilai tukar melemah menjadi Rp. 14.910/1US\$ dan pilihan kedua nilai tukar menguat menjadi Rp. 13.450/1US\$. Kondisi nilai tukar mengalami pelemahan 5% menjadi Rp 14.910/US\$ menyebabkan provitabilitas privat menurun sebesar Rp. 6.187.902/tahun (71%) pada skala  $\leq$  5000 ekor dan Rp. 11 695.246/tahun (43%) skala  $>$  5000 ekor . Pada skala  $\leq$  5000 ekor penurunan provitabilitas ini disebabkan oeningkatan harga pakan sebesar Rp. 106/kg dan peningkatan harga OVD (obat, vaksin dan vitamin) sebesar Rp. 954/unit. Pada skala  $>$  5000 ekor penurunan profitabilitas disebabkan oleh peningkatan harga pakan sebesar Rp. 113/kg dan pen ingkatan harga OVD

sebesar Rp. 1.240/unit. Peningkatan harga input akibat pelemahan nilai tukar rupiah ditunjukkan oleh nilai NPCI (net protection coefficient input) pada kedua skala yang meningkat dari 1,03 menjadi 1,05, artinya [pelemahan nilai tukar menyebabkan harga output menjadi 5% lebih mahal dari pada harga sosialnya. Daya saing kedua skala usaha juga menurun ditunjukkan dengan nilai PCR 0,95 menjadi 0,97 dan 0,94 menjadi 0,96.

Apresiasi nilai rupiah menyebabkan peningkatan profitabilitas yang disebabkan penurunan harga pakan sebesar 68 Rp/kg dan penurunan harga OVD sebesar 1,19%. Penurunan harga input pakan dan OVD ditunjukkan oleh nilai NPCL yang menurun dari 1,03 menjadi 1,01 artinya penguatan rupiah menyebabkan harga output hanya 1% lebih mahal daripada harga sosialnya dari semula 3%. Daya saing pada kedua skala juga meningkat dengan nilai PCR menurun dari 0,94 menjadi 0,93 dan dari 0,95 menjadi 0,94. Nilai tukar yang semakin kuat akan meningkatkan efisiensi dan daya saing finansial kemitraan ayam pedaging

Disamping hasil yang sudah diperoleh melalui penelitian ini , tim peneliti sudah berhasil mempublikasikan hasil penelitian di jurnal internasional yaitu pada jurnal of Business Management yang dipublikasi pada volume 5 nomor 10 bulan oktober 2019 dengan judul artikel BUSINESS FEASIBILITY AND CULTIVATION MANAGEMENT OF BROILER UNDER PARTNERSHIP SCHEME. Selain itu luaran lainnya adalah peneliti menjadi pembicara dalam International Conference Vocational on Higher Education (ICVHE) PADA tanggal 5-7 Agustus 2019 , pembicara pada International Conference on Agribusiness and Rural Development (ICONARD 2020) pada 13-14 oktober 2020 dimana artikel yang dipresentasikan akan dipublikasi pada Prosiding E3S yang terindex Scopus dimana sampai laporan ini di buat artikel yang sudah dipresentasikan sudah direview oleh reviewer dan sudah direvisi oleh tim peneliti dan sudah dikembalikan ke pelaksana Konferensi (UMY Yogyakarta) untuk proses publikasi. Selain itu tim peneliti sudah mengirimkan artikel ke Journal Of Agricultural Sciences-Sri Lanka pada bulan agustus 2020 dimana sampai saat laporan di buat status artikel adalah sudah selesai direview dan sudah direvisi oleh tim peneliti dan masih menunggu proses publikasi mengingat jurnal ini adalah terindex SCOPUS sehingga harus menunggu antrian lebih lama Diharapkan semua artikel akan dipublikasi secara online paling lambat tahun 2021.

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D. **STATUS LUARAN:** Tuliskan jenis, identitas dan status ketercapaian setiap luaran wajib dan luaran tambahan (jika ada) yang dijanjikan pada tahun pelaksanaan penelitian. Jenis luaran dapat berupa publikasi, perolehan kekayaan intelektual, hasil pengujian atau luaran lainnya yang telah dijanjikan pada proposal. Uraian status luaran harus didukung dengan bukti kemajuan ketercapaian luaran sesuai dengan luaran yang dijanjikan. Lengkapi isian jenis luaran yang dijanjikan serta unggah bukti dokumen ketercapaian luaran wajib dan luaran tambahan melalui Simlitabmas mengikuti format sebagaimana terlihat pada bagian isian luaran

Disamping hasil yang sudah diperoleh melalui penelitian ini, tim peneliti sudah berhasil mempublikasikan hasil penelitian di jurnal internasional yaitu pada jurnal of Business Management yang dipublikasi pada volume 5 nomor 10 bulan oktober 2019 dengan judul artikel BUSINESS FEASIBILITY AND CULTIVATION MANAGEMENT OF BROILER UNDER PARTNERSHIP SCHEME. Selain itu luaran lainnya adalah peneliti menjadi pembicara dalam International Conference Vocational on Higher Education (ICVHE) PADA tanggal 5-7 Agustus 2019, pembicara pada International Conference on Agribusiness and Rural Development (ICONARD 2020) pada 13-14 oktober 2020 dimana artikel yang dipresentasikan akan dipublikasi pada Prosiding E3S yang terindex Scopus yang sampai laporan ini di buat artikel yang sudah dipresentasikan sudah direview oleh reviewer dan sudah direvisi oleh tim peneliti dan sudah dikembalikan ke pelaksana Konferensi (UMY Yogyakarta) untuk proses publikasi. Selain itu tim peneliti sudah mengirimkan artikel ke Journal Of Agricultural Sciences-Sri Lanka (Terindex SCOPUS) pada bulan agustus 2020 dimana sampai saat laporan di buat status artikel adalah sudah selesai direview dengan rekomendasi dapat di publikasi dengan perbaikan dan sudah direvisi kembali oleh tim peneliti dan masih menunggu proses publikasi mengingat jurnal ini adalah terindex SCOPUS sehingga harus menunggu antrian lebih lama. Diharapkan semua artikel akan dipublikasi secara online paling lambat tahun 2021.

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E. **PERAN MITRA:** Tuliskan realisasi kerjasama dan kontribusi Mitra baik *in-kind* maupun *in-cash* (jika ada). Bukti pendukung realisasi kerjasama dan realisasi kontribusi mitra dilaporkan sesuai dengan kondisi yang sebenarnya. Bukti dokumen realisasi kerjasama dengan Mitra diunggah melalui Simlitabmas mengikuti format sebagaimana terlihat pada bagian isian mitra

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**F. KENDALA PELAKSANAAN PENELITIAN:** Tuliskan kesulitan atau hambatan yang dihadapi selama melakukan penelitian dan mencapai luaran yang dijanjikan, termasuk penjelasan jika pelaksanaan penelitian dan luaran penelitian tidak sesuai dengan yang direncanakan atau dijanjikan.

Pada tahun kedua penelitian ini maka peneliti menghadapi masa pandemi covid 19 sehingga perlu adanya penyesuaian dalam proses pengumpulan data di lapangan. Namun demikian proses pengumpulan data oleh tim peneliti dilakukan pada saat awal penyebaran covid 19 di Sulawesi Utara yaitu bulan maret dan april 2020 dimana penerapan protokol kesehatan belum terlalu ketat di wilayah Sulawesi Utara. Namun demikian peneliti sudah menerapkan protokol kesehatan saat bertemu dengan responden termasuk melakukan proses wawancara melalui telepon dan media sosial (WA). Kendala dalam mempublikasikan luaran penelitian pada jurnal internasional bereputasi (Journal of Agricultural Sciences - Sri Lanka, Terindeks SCOPUS)) adalah banyaknya antrian di jurnal tersebut sehingga harus harus menunggu lebih lama sejak di submit bulan agustus 2020. Namun demikian hingga saat laporan akhir ini dibuat status artikel yang di submit ke jurnal internasional tersebut sudah sedang di review dan di harapkan akan di publikasi paling lambat pada tahun 2021. Untuk artikel yang sudah dipresentasikan pada International conference of Vocational Higher Education (ICVHE) tahun 2019 sampai laporan ini dibuat belum dipublikasi oleh pihak penyelenggara konferensi (Universitas Indonesia) karena masih menyelesaikan proses final uploading semua artikel ke pihak publisher (Scite Press) sehingga tim peneliti diminta untuk menunggu waktu publikasi prosiding tersebut. Artikel hasil penelitian lainnya yang sudah di presentasikan pada International Conference of Agribusiness and Rural Development (ICONARD) 2020 sudah pada tahapan selesai di review sehingga tim peneliti masih menunggu proses publikasi prosiding di E3S web of conference series (Terindex SCOPUS) mengingat banyaknya peserta konferensi yang artikelnya juga sementara di review sampai saat laporan ini dibuat. Karena itu Keterlambatan publikasi pada 2 konferensi internasional bukan disebabkan oleh peneliti tetapi oleh kendala teknis oleh pihak penyelenggara kegiatan konferensi.

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**G. RENCANA TINDAKLANJUT PENELITIAN:** Tuliskan dan uraikan rencana tindaklanjut penelitian selanjutnya dengan melihat hasil penelitian yang telah diperoleh. Jika ada target yang belum diselesaikan pada akhir tahun pelaksanaan penelitian, pada bagian ini dapat dituliskan rencana penyelesaian target yang belum tercapai tersebut.

Pada akhir penelitian ini masih ada target luaran yang belum tercapai yaitu publikasi jurnal internasional bereputasi dan publikasi di prosiding internasional bereputasi . Tim peneliti akan terus berkomunikasi dengan pengelola jurnal internasional dan panitia penyelenggara konferensi internasional secara intensif agar agar semua artikel yang sedang diproses dapat dipublikasi paling lambat awal tahun 2021

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**H. DAFTAR PUSTAKA:** Penyusunan Daftar Pustaka berdasarkan sistem nomor sesuai dengan urutan pengutipan. Hanya pustaka yang disitasi pada laporan akhir yang dicantumkan dalam Daftar Pustaka.

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Dokumen pendukung luaran Wajib #1

Luaran dijanjikan: Publikasi Ilmiah Jurnal Internasional

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1. Bukti sedang direview
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Dokumen sudah diunggah:

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2. Bukti sedang direview

Dokumen belum diunggah:

-

Nama jurnal: Journal of Agricultural Sciences - Sri Lanka

Peran penulis: corresponding author | EISSN: 1391-9318/2386-1363

Nama Lembaga Pengindek: SCOPUS

URL jurnal: <https://jas.sjoi.info/>

Judul artikel: Investment Advantages of Broiler Production Using the Partnership System : A Study In Indonesia

# Investment Advantages of Broiler Production Using the Partnership System : A Study In Indonesia

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## ABSTRACT

**Purpose :** Broiler business with independent pattern in Minahasa Regency, North Sulawesi often experiences problems with input and output price fluctuations. Therefore, farmers try to collaborate in partnership with companies that have better capital and technology. An evaluation needs to be carried out on partnership pattern broiler business as a first step in the development of the poultry industry in Minahasa, North Sulawesi Province

**Research Method:** The research was case study performed in UD. Matuari Waya, the only broiler farming entities in, District of Kalawat, Regency of North Minahasa, of which was partnered with a national-scale husbandry company, Charoen Phokpand Ltd. Data was analyzed through business feasibility scope using analysis of investment criteria and sensitivity model

**Findings:** Partnership model was financially beneficial to be developed further, by NPV value of Rp.1,487,877,624, net B/C, of 1.219, internal rate of return of 63.18% and the payback period within 1 year 7 months. Moreover, the result of sensitivity analysis shows that: if price of broiler declined about 15% and operational cost was increased of 12%, the broiler business could still be performed. Nonetheless, whereas broiler's production declined for 10%, this partnership was non-feasible to be developed since the value of NPV was negative and net B/C was lower than 1.

**Research limitations:** This study was constrained by the limited broiler breeders with partnership pattern in Kalawat District as the region with largest broiler population.

**Originality/Value:** The results provide new information on business development standards for broiler chicken partnerships in the context of a decline in output price, decrease production price and an increase in inputs price.

**Keywords:** Feasibility, Investment, Partnership, Profit, Sensitivity

## INTRODUCTION

Broiler, one of livestock commodities, is favorite and well-liked type of chicken by public, since it has

47 delicious taste of its meat and high nutrition. Hence, broiler has potency to be developed in terms of  
48 improving economy and fulfilling public's protein necessity (Alderson and Jordaan, 2007; Tuffour  
49 and Oppong, 2014; Maidala *et al.*, 2017;). Broiler, in addition, has been turned as one of primary  
50 commodities in the sub-sector of livestock developed in Indonesia, as, according to Statistik  
51 Peternakan Indonesia (2019), the average consumption of broiler per capita in Indonesia, in 2018, was  
52 5.683kg, increasing of 11.22% than 2017, 5.110 kg/capita/year. Whereas, viewed from production of  
53 broiler in Indonesia, it was dominated by 12 provinces, including of North Sulawesi Province, greatly  
54 contributing to national production of broiler as 3.64%, while the biggest contribution came from  
55 Province of West Java, about 40.20%. Outside of Java, the contribution of national production of  
56 broiler was averagely 585 thousand ton. Nationally, in addition, the significant increasing of broiler  
57 production outside of Java was occurred in 2018, 5.81%, improving from previous year respectively  
58 in 2017 ( 2.08%) and 2016 ( 0.14%).

59  
60 In fact, condition of breeders shows that there are shortages taken place, such as capital procurement,  
61 changes of input and output price, human resource, and precise technology procurement for broiler  
62 farming (Elsedig *et al.*, 2015; Jaelani *et al.*, 2013; Rudra *et al.*, 2018; Rana *et al.*, 2012)). From this, it  
63 is necessarily required cooperation in the form of partnership between broiler breeders and company  
64 having a huge capital (Indarsih *et al.*, 2012; Nurtini *et al.*, 2017; Singh *et al.*, 2018). It is performed by  
65 the purpose to improve technical and economic performance of broiler farm. Moreover, it can provide  
66 meat of broiler with guaranteed quantity, nutrition quality, and affordable price for consumers as well  
67 as profits for breeders (Tandogan and Cicek, 2016; Samarakoon and Samarae, 2012; Ike and  
68 Ugwumba, 2011; Rana *et al.*, 2012; Abdurofi *et al.*, 2017; Raut *et al.*, 2017). Regency of North  
69 Minahasa is a region having the biggest population of broiler farming in Province of North Sulawesi.  
70 According to Badan Pusat Statistik Sulawesi Utara (2019) total of broiler population in Regency of  
71 North Minahasa was 4,508,180 broilers or 58.43% from total of broiler population in the Province of  
72 North Sulawesi, with broiler's production and consumption respectively of 4,118,236 kg and 634,285  
73 kg, meaning that 3,484,000 kg of broiler's meat were contributed by Regency of North Minahasa to  
74 sufficiently fulfill meat necessity in the Province of North Sulawesi and eastside of Indonesia.

75 Kalawat District is the region with the largest broiler population among 10 District in North  
76 Minahasa Regency covering 25.67 percent of the total population of broilers. Almost all broiler  
77 breeders in this area carried out their business independently except UD Matuari Waya as the only  
78 small scale livestock business that cooperates with a partnership system with one of the national scale  
79 animal husbandry companies namely Charoen Phokpand Jaya Farm Ltd

80  
81 UD Matuari Waya. is established in 2009, owned by Mr. Karel Sompotan, breeder, and located in  
82 Village of Kalawat, District of Kalawat , North Minahasa Regency by ownership scale of 12.500  
83 broilers. Specifically, an issue dealt with breeders is that input price of feeding and day old chick  
84 (DOC) and meat's price are sometimes inconsistent or fluctuated, so that it affects on broiler  
85 production and income. Other problems, on the other hand, are diseases attacking broiler raised by  
86 UD.Matuari Waya. Consequently, it causes declining broiler's production and productivity, and,  
87 eventually, it results loss due to disease outbreak. To solve such issues, UD.Matuari Waya, since  
88 2013, has cooperated with Charoen Phokpand Ltd, a national husbandry company having a better  
89 capital and technology. By this partnership system, Charoen Phokpand Ltd provides day old chick  
90 (DOC) of broilers, feeds, medicine, technical and technology counseling, and various types of  
91 incentive, such as market incentive, achievement incentive, which its value has been jointly agreed  
92 upon both partnered companies. Whereas, breeders provide cage, equipment, heater, labor, and rice's  
93 husk. Based on previous researches, it shows that broiler production under partnership design was  
94 profitable enough, (Yusuf *et al.*, 2016; Khan and Afzal, 2018; Istanto *et al.*, 2010; Rasak and Hassan,  
95 2014; Niswatin *et al.*, 2016; Nurtini *et al.*,2017).

96  
97 However, there was no review evaluating declining risk of production at 10% and decreasing price of  
98 broiler's meat of 15% well as increase of production inputs price by 12%. This is very important  
99 because broiler chicken farms in North Sulawesi have experienced problems with fluctuations in feed  
100 prices and broiler chicken production at the end of 2018 until early 2019 so that it will have an  
101 impact on breeders' incomes. Therefore, this research attempts to evaluate profitability of broiler  
102 production under partnership system between UD.Matuari Waya and effects of fluctuated price of

103 input and output as well as production fluctuation against business's profit.

104

105 **MATERIALS AND METHODS**

106 *Site, Sample, Time, and Technique of Data Collection*

107 The research location was in Kalawat District, North Minahasa Regency as the area with the largest  
108 broiler population. Subsequently selected purposively UD Matuari Waya as the only broiler breeding  
109 business in Kalawat District with a business scale of 12,500 heads which cooperates in partnership  
110 with one of the national companies in the field of animal husbandry namely Charoen Phokpand Jaya  
111 Farm Ltd.

112

113 This small-scale company has operated since 2009 and started cooperation with Charoen Phokpand  
114 Ltd since 2013. Then, data collection was done during February - March 2020 through depth  
115 interview with respondents, such as the owner of UD. Matuari Waya and employees, using  
116 questionnaire having been prepared and observing husbandry's site. Data collection consisted of  
117 primary and secondary data such revenue and production costs, mortality rate of broiler chickens,  
118 selling price, weight of chickens when sold, sales of manure broiler in one production period, broilers  
119 population in North Minahasa Regency, broilers population in North Sulawesi Province, broilers'  
120 meat production and consumption per year

121

122 *Data Analysis*

123 To acknowledge profitability of partnership system in broiler production, analysis of investment  
124 criteria was utilized (Gittinger, 1986).

125 Net Present Value analysis is used to know current value of business's profit obtained in  
126 future by following formulation as hereunder:

127

128 
$$NPV = \sum_{t=1}^n \frac{B_t - C_t}{(1 - i)^t} \dots\dots\dots (1)$$

129 where,

- 131 Bt :Total of gross revenue from business activity in year t
- 132 Ct :Total of gross expenditure from business activity in year t
- 133 n :Economic period (1,2,...n)



134 I :Discount rate  
 135 In addition, criteria used in assessing business activity are determined by as follows:  
 136 NPV >0 :Profitable entity  
 137 NPV <0: Non-profitable entity  
 138 NPV= 0: Such entity returns capital equal with expenditure expensed.  
 139

140 Benefit Cost Ratio (BCR) is a comparison in which, by such manner, the numerator consists of  
 141 present value from total of net profit in year where net profit is positive, and comprises of present  
 142 value of total of *benefit* cost in year, where net profit is negative.

$$\begin{aligned}
 & \sum_{t=1}^n \frac{B_t - C_t}{(1+i)^t} \quad (B_t - C_t > 0) \quad \text{PV Bebenefit} \\
 \text{B/C} = & \frac{\sum_{t=1}^n \frac{B_t - C_t}{(1+i)^t}}{\sum_{t=1}^n \frac{C_t - B_t}{(1+i)^t} \quad (B_t - C_t < 0) \quad \text{PV Cost}} \dots\dots\dots(2)
 \end{aligned}$$

150 The criteria are as hereunder:  
 151 B/C Ratio > 1 means that project is feasible or performable.  
 152 B/C Ratio = 1 means that project is even between its cost and benefit, so that it depends on decision-  
 153 makers whether they will perform or not.  
 154 B/C Ratio < 1 means that project is not feasible or non-performable.  
 155

156 Internal Rate of Return can be calculated by following formulation (Kadariah, 1999), as hereunder:

$$\text{IRR} = \text{DF1} + \frac{\text{NPV 1}}{\text{NPV 1} \square \text{NPV 2}} (\text{DF2} - \text{DF1}) \dots\dots\dots(3)$$

160 where,  
 161 NPV1 = NPV Positive is in the lowest extent of discount rate  
 162 NPV2 = NPV Negative is in the highest extent of discount rate  
 163 DF1 = Discount rate of NPV1  
 164 DF2 = Discount rate of NPV2

165 Then, the criteria usually used in assessing an entity can be determined by as follows:  
 166 IRR > Cost of capital means that such entity is feasible and profitable.  
 167 IRR < Cost of capital means that such entity is not feasible and non-profitable.  
 168

169 Payback period displays duration (in years) of investment that can calculatedly return. This period  
 170 shows that comparison between initial investment with yearly cash flow, calculated by following  
 171 formulation Gittinger, 1986), as follows:

$$\text{Payback Period} = \frac{\text{Investment value}}{\text{Proceed}} \dots\dots\dots(4)$$

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$$\text{Payback Period} = n + \frac{a - b}{c - b} \times 1 \text{ year} \dots\dots\dots(5)$$

where,  
n = Last year where total of net cash flow has not cover initial investment.  
a = Total of initial investment  
b =Total of cash in year – n  
c =Total of cash flow in year n + 1

The criteria, further, used is that if payback period < economic period of project, it is feasible. Contrastingly, if payback period > economic period of project, the project is non-performable or not feasible.

Sensitivity analysis is performed to know profitability of broiler business if there is changing of selling price of broiler for 15% and increasing cost of day old chick (DOC), feeds, medicines, vaccines and vitamins of 12%, and, then,broiler production decreases of 10%.

**RESULTS AND DISCUSSION**

*Characteristic of Respondents*

The broiler business farm run by UD. Matuari Waya in the Village of Kalawat, District of Kalawat, Province of North Sulawesi is owned by Karel Sompotan, 59 years old, and having formal education in Bachelor of Agriculture. He has started to cultivate broiler since 2005 by entity scale of 200-300 broilers in 2009, and, later, established broiler production under UD.Matuari Waya, of which its entity scale was 5000 broilers. Since 2013, he has cooperated with Charoen Phokpand Ltd and started to develop his entity scale into 12,500 broiler up now.

*Farm Management under Partnership System of UD.Matuari Waya and Charoen Phokpand Ltd.*

Within the partnership system in broiler production, it has been regulated all types of cooperation between both jointly collaborated parties, including all respectively rights and responsibilities and risk bore upon. Charoen Phokpand Ltd as main company has responsibility to provide livestock production infrastructures, covering of day old chick (DOC), feeds, medicines, technology

209 counseling, and various types of incentive-such as market and achievement incentive, of which its  
 210 value has been agreed upon both partnered parties. Meanwhile, breeders provide cage and equipment,  
 211 employees, heater and rice's husk. Specifically, under this system, several terms and conditions  
 212 drafted in partnership agreement are agreed upon both companies performing partnership.

213

214 ***Revenue of Broiler Breeder***

215 Revenue derived from broiler production is a difference of selling result of broiler, incentive of feed  
 216 conversion ratio (FCR), selling of rice's husk with operational cost bore by both jointly companies or  
 217 profit-sharing system. The finding of this research reveals that broiler selling by plasma company was  
 218 based on, namely, the rate of mortality of 6%, averagely final weight of broiler of 1.7 kg/broiler,  
 219 selling price of IDR.18,500/kg. Then, selling result of per broiler was IDR.31,450. While, the harvest  
 220 was performed by Charoen Phokpand Ltd from breeders for each period of broiler production.

221

222 **Table 01: Revenue of breeders per production period**

Number	Type of Revenue	Total (IDR)	Percentage (%)
1	Selling of broiler	354,756,000	91.03
2	FCR Incentive	30,427,200	7.80
3	Selling of rice's husk	4,500,335	1.17
	Total of revenue	389,683,535	100.00

223

224 Based on above data in the Table 01, it shows that revenue of broiler's breeders within one production  
 225 period was, totally, IDR. 389,683,535. In a year, there were 6 production periods, comprising of  
 226 January-February, March-April, May-June, July-August, September-October and November-  
 227 December, respectively.

228

229 Approaching National Holidays, such as Ied Fitri or Christmas, price of broiler is usually increasing  
 230 determined by main company, since there is increasing demand from consumers. Then, revenue  
 231 derived from incentive of feed conversion ratio (FCR) is a difference from total of feeds and final  
 232 weight of broiler. Whereas, final weight of broiler achieved by breeders was under its standard (1.75),  
 233 so they obtain incentive of IDR 225 multiplied by broiler's weight. Moreover, the selling of rice's

234 husk is additional revenue of breeders in each period, which it was obtained 600 sacks, turned as  
 235 compost by the price of IDR.7,500/sack.

236  
 237 ***Expenditure of Investment***

238 UD Matuari Waya has invested since the beginning of establishment for fulfilling all necessities in  
 239 broiler production. Investment expensed by joint company comprised of cage, equipment, and  
 240 electricity installation. Economically, the rate of cage period is 10 years, and the equipment is 5 years  
 241 averagely (Chang, 2007). For entity scale of 12,500 broilers, the area of cage established by joint  
 242 breeder was 1,100 m<sup>2</sup> with the price of IDR. 350,000/m<sup>2</sup>. Further, the equipment included food and  
 243 drink tools, heater, water’s tank, tarpaulin, scales, bucket, electric generator and 12-kg-gas tube. In  
 244 detail, cost of investment for broiler production run by UD.Matuari Waya during one period is  
 245 presented in following Table 02.

246

247 **Table 02: Investment cost of UD Matuari Waya**

Number	Type of investment cost	Total (IDR)	Percentage (%)
1	Cage	385,000,000	88.24
2	Equipment	45,287,565	10.38
3	Electricity installation	6,000,000	1.37
Total of investment cost		436, 287,565	100.00

248

249 ***Operational Cost***

250 Partnership model of broiler production has two types of financing, comprising of both  
 251 jointly and individually operational cost (UD Matuari Waya and Charoen Phokpand Ltd).

252 The component of jointly operational cost has been agreed by both companies, plasma and  
 253 main company collaborated since the signing date of partnership agreement. Various types of  
 254 operational cost is depicted in the Table 03 as hereunder:

255

256

257

258

259 **Table 03: Annual type and total of operational cost between UD. Matuari Waya and Charoen**  
 260 **Phokpand Ltd**

Number	Type of costs	Total of costs (IDR)	Percentage (%)
1	Day old chick (DOC)	412,500,000	25.22
2	Feeds	1,207,156,338	73.80
3	Medicines, vaccines, and vitamins	15,975,000	0.98
Total of operational cost		1,635,631,338	100.00

261

262 The result of this research based on Table 03 exhibits that cost of feeds were component of  
263 production cost (73.80%), cost of day old chick (DOC) (25.22%), and cost of medicines  
264 (0.98%). Type of day old chick (DOC) used was SR-707. In addition, feeds were derived  
265 from BR-1, mainly for chicken's age  $\leq$  20 days (starter period) and BR-2 for chicken's age  $\geq$   
266 20 up to harvest period (Gandhi and Sutanto, 2017). Price of feeds in the starter phase was  
267 IDR. 7,750 per kg and price for the finisher phase was IDR. 7.500 per kg. Total of feeds  
268 required for chicken in each period was 2 kg/head. Cost of medicines, vaccines, and vitamins  
269 were relatively small since they were not given every day and the mechanism of feeding was  
270 through broiler's drinking system. Specifically, the cost of medicines, vaccines, and vitamins  
271 was IDR 1,330/head. This finding is strengthen by the result of Ike and Ugwumba (2011)  
272 stating that successful of broiler production was depended on some significant production  
273 factors such as feeding, day old chick (DOC), and medicines, of which feeding had portion of  
274 68% in the structure of production cost in the broiler production at North Onitsha, Nigeria

275

276 Operational cost expensed by UD. Matuari Waya is fixed and variable cost. Fixed cost  
277 comprises of electricity, tax, purchasing of rice's husk, cage depreciation and equipment,  
278 while variable cost is labor cost. Annually, total of operational cost expensed within six  
279 production periods by UD. Matuari Waya was IDR. 40,550,000, comprising of fixed cost of  
280 IDR.10,550,000 and labor cost of IDR. 30,000,000. In addition, UD. Matuari Waya  
281 employed five-contractual labors by salary of IDR.1,000,000/production period respectively.

282

283 *Analysis of Investment Criteria*

284 This analysis was performed to know whether investment project of broiler existing in the  
 285 Village of Kalawat, Regency of North Minahasa was profitable or not. It was reviewed from  
 286 various types of investment criteria analysis, such as net present value, B/C, IRR, payback  
 287 period or break event point. After counting annual cost and revenue for five years of broiler  
 288 chicken partnership business then NPV, IRR, B/C value is obtained. The calculation of cash  
 289 flow investment of broiler in the UD. Matuari Waya became the base for determining  
 290 business feasibility. Following, Table 04 portrays the calculation result of Net Present Value,  
 291 Internal Rate of Return, Benefit Cost Ratio and Payback Period

292  
 293 **Table 04: The Calculation of Investment Criteria in the Partnership System of Broiler**  
 294 **Production in the Village of Kalawat, Regency of North Minahasa**

Number.	Investment Criteria	Value
1	Net Present Value (IDR)	1,487,877,624
2	Net Benefit Cost Ratio	1.219
3	Internal Rate of Return	63.18 %
4	Payback Period	1 year 7 months

295  
 296 From above result of investment criteria analysis, Table 04 demonstrates that the partnership  
 297 of broiler production between UD. Matuari Waya and Charoen Phokpand Ltd was financially  
 298 profitable to be developed. This was happened since net present value showed positive, net  
 299 benefit ratio was more than 1 (one), and internal rate of return was higher than social discount  
 300 rate prevailed in the Province of North Sulawesi, while the research was performed. During  
 301 the research was conducted, social discount rate in commercial bank was 15.75%, and  
 302 internal rate of return achieved was 63.18%. It means that partnership system of broiler  
 303 production could be able to return loan capital up to above social discount rate prevailed at  
 304 that time. Moreover, this partnership was able to return investment capital in relatively short  
 305 time, which was 1 year 7months, compared with entity's economic period.

306  
 307 *Analysis of Sensitivity*

308 It was done to acknowledge company's profit whereas there was changing of input and  
 309 output price.

310  
 311 ***Broiler's Selling Price Dropped to 15 %***

312 Whereas broiler's selling price declined up to 15%, so performance of broiler production in  
 313 the UD. Matuari Wayawas presented in following Table 05.

314

315 **Table 05. Feasibility of broiler production as broiler's selling price dropped to 15%**

Number	Investment Criteria	Value
1	Net Present Value (IDR)	325,126,375
2	Net B/C	1.068
3	Internal Rate of Return (IRR)	39.12 %
4	Payback Period	3 years 8 months

316

317 Table 05 depicts that whereas selling price of broiler dropped to 15%, so partnership model of UD.  
 318 Matuari Waya was still profitable. However, payback period took longer, which was 3 years 8  
 319 months. It could happen since NPV was positive, even though it was lower than NPV during stable  
 320 price. Net B/C value was more than one, meaning that investment still provided profit. Though IRR  
 321 value decreased of 39.12%, it could cover off cost of interest loan prevailed in commercial bank at  
 322 15.75%. This finding, then, was quite similar with Gandhi and Sutanto (2017), reporting that  
 323 decreasing in broiler's selling price at 5% could still provide profit for broiler production, by its  
 324 payback period during 3 years 3 months.

325

326 ***Price of Day Old Chick (DOC), Medicines, Vaccines, and Vitamins Rose Up to 12%***

327

328 Analysis result from effects of increasing price on day old chick (DOC), feeds, medicines, vaccines,  
 329 and vitamins showed 12% against profitability of broiler production in the Village of Kalawat,  
 330 Regency of Minahasa Utara. It can be seen from following Table 06.

331 **Table 06: Feasibility of broiler production as input price rose up to 12%**

Number.	Investment Criteria	Value
1	Net present value (IDR)	418,135,278
2	Net B/C	1.193
3	Internal rate of return (IRR)	44.76 %
4	Payback period	2 years 6 months

332

333 The analysis result from above, in the Table 06, shows that increasing of input price, or factors of  
 334 production covering of day old chick, feeds, medicines, vaccines, and vitamins, at 12% experienced  
 335 by broiler production of UD. Matuari Waya was still seemingly feasible or performable, since NPV  
 336 value was positive, or IDR.418,135,278. Nonetheless, it was lesser than initial value of NPV before an  
 337 increasing of input price. This result was in same vein with other researches (Balamurugan and  
 338 Manoharan , 2014). Further, net B/C value was higher than 1 (one), IRR was at 44.76%, higher than  
 339 social discount rate prevailed of 15.75%. Another indicator of feasibility business was business  
 340 capability to return investment capital within 2 years 6 months.

341

342 **Broiler Production Decreased at 10%**

343 The analysis result using investment criteria displays that whereas broiler production decreased up to  
 344 10%, this partnership model was not continuously feasible to be executed by using value of feasibility  
 345 indicators as seen in the Table 07.

346

347 **Table 07: Feasibility of broiler production as production decreased at 10%**

Number	Investment Criteria	Value
1	Net present value (IDR)	-27,865,169
2	Net B/C	0.774
3	Internal rate of return (IRR)	14.37 %

348

349 The result as presented in the Table 07 indicates that whereas broiler production decreased at 10%, the  
 350 broiler production of UD. Matuari Waya was not feasible to be developed, since it would result loss as  
 351 shown by negative value of Net Present Value, or Rp - 27.865.169, and net B/C smaller than one.  
 352 Thus, it is implied on necessarily counseling from the main company, PT. Charoen Phokpand, to  
 353 prevent any occurrence of risk of production decreasing. This finding is in accordance with Shaikh  
 354 and Zala (2011), but it shows contradictive result with the work of Kalamkar (2012) and Varinder et  
 355 al. (2010) It is happened since decreasing of broiler production was due to disease outbreak, adversely  
 356 effecting on declining revenue of broiler's selling. Hence, the company involved in partnership did  
 357 not directly make new procurement of day old chick (DOC) before cage sterilization requiring 2  
 358 weeks until one month. In fact, such company had expensed for maintenance cost of cage, feeds,  
 359 medicines, vaccines and vitamins, and labor's salary during production process. Therefore, the role of



360 main company in this partnership system is highly significant in terms of technical counseling so that  
361 broiler is avoided from disease outbreak resulted on decreasing of business profit (Rasak and Hassan,  
362 2014).

### 363 **CONCLUSION**

364 Financially, the broiler production of UD Matuari Waya, located in the Village of Kalawat, Regency  
365 of Minahasa Utara and acted as plasma company under partnership system with Charoen Phokpand  
366 Ltd, the main company, is profitable and feasible to be further developed since it had positive value of  
367 net present value, more than one of net B/C, higher internal rate of return (IRR) than social discount  
368 rate prevailed in commercial bank.

369  
370 Based on the result of sensitivity analysis, it shows that whereas there was decreasing of broiler's  
371 selling price at 15%, or increasing price of day old chick (DOC), feeds, medicines, vaccines, and  
372 vitamins at 12%, broiler production could still provide profit since it had positive value of NPV,  
373 higher value of IRR than social discount rate. However, if there was decreasing of broiler production  
374 at 10%, the broiler production of UD. Matuari Waya was not feasible to be developed since it had  
375 negative value of NPV and smaller value of net B/C than one and lower value of IRR than social  
376 discount rate. To avoid risk of loss from decreasing of broiler production, therefore, the role of main  
377 company, Charoen Phokpand Ltd is highly significant both technical and technological advise for UD.  
378 Matuari Waya as partner company.

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**Journal of Agricultural Sciences – Sri Lanka**  
**Referee report**

**1. Theme of the paper**

**Title: Investment Advantages of Broiler Production Using the Partnership System in Regency of North Minahasa, Province of North Sulawesi, Indonesia (Case study on UD Matuari Waya Broiler Farming)**

**Suitable/not suitable/ Need Improvements: Need Improvements**

If not, please give your suggestion

**Investment Advantages of Broiler Production Using the Partnership System : A study in Indonesia**

**2. Abstract**

**Prepared according to the Journal Format: Yes**

**Do the keywords accurately reflect the content? Yes** (Add as suggested in the text also)

**Appropriate/inappropriate/need development: Appropriate**

Please give your comments

**3. Introduction/Background information**

In this Section the author/s were able to

**Sets out the strong argument about importance of the research : Very Much**

**Summarizes recent research related to the topic: General**

**Highlights gaps in current understanding or conflicts in current knowledge: Very Much**

**Establishes the originality of the research aims by demonstrating the need for investigations in the topic area: Very Much**

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Considering above facts this section is

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#### **4. Objectives**

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#### **5. Materials and method**

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**Are the conclusions consistent with the evidence and arguments presented?** Very Much

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- 3 Suitable for publication after doing Major amendments
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-

Peran penulis: corresponding author

Nama Konferensi/Seminar: International Conference on Agribusiness and Rural Development 2020

Lembaga penyelenggara: Universitas Muhamadiyah Yogyakarta

Tempat penyelenggara: Faculty of Agriculture Universitas Muhammadiyah Y

Tgl penyelenggaraan mulai: 13 Oktober 2020 | Tgl selesai: 14 Oktober 2020

Lembaga pengindeks: SCOPUS

URL website: <https://iconard.umy.ac.id/>

Judul artikel: The competitiveness of broiler in district of Tondano Utara Regency of Minahasa, Province of North Sulawesi Indonesia

# Competitiveness of broiler in Tondano Utara district, regency of minahasa in north sulawesi province, Indonesia

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**Abstract:** The research aims to analyze competitiveness of broiler in District of Tondano Utara, Regency of Minahasa. Sampling technique utilized was saturated sampling (census method) by taking all existing samples, containing of 68 samples of broiler in the region of District of Tondano Utara. Further, data analysis employed Policy Analysis Matrix (PAM). The analysis finding shows that PCR (Private Cost Ratio) value was less than (<) 1, which was 0.65. This means that business system of broiler cultivated by breeders had competitive advantage. Breeder was able to compete with broiler business in other regions, instead of enabling to finance domestic factor in private price. Husbandry sector had competitive advantage whereas DRCR (Domestic Resources Cost Ratio) value was less than (<) 1, representing that advantage obtained by breeder was greater than its social cost of non-tradable input. In broiler's case showed in District of Tondano Utara, DRCR value was less than (<) 1, which was 0.96, depicting that husbandry sector had comparative competitiveness since it could finance its domestic factor related to social cost and it was economically efficient. Therefore it is recommended to encourage market expansion to the export market through the development of broiler chicken meat processing industry in North Sulawesi

## 1 Introduction

Broiler is one of poultry types popularly cultivated by public. A demand of chicken's meat as a supplier of animal protein is increasingly great in number. It currently has proven that chicken's meat is the biggest contributor against meat's domestic consumption and production in Indonesia. In 2018, domestic production of chicken's meat was 3,565,495 ton, and consumption demand was 3,047,676 ton, whereas broiler contributed to 51 percent of chicken's meat [1,2]

On the other hand, however, broiler industry still deals with some issues in various sub-sectors of agribusiness, constituting adverse effects against competitiveness [3,4]. In upstream sub-sector, issue related to feed procurement becomes significantly main matter. Most of feed materials still depends on import, such as import of corn reaching up 40-50 percent; soybean residue of 95 percent; fish flour of 90-92 percent; bone flour and vitamin/feed additive about nearly 100 percent of import [5]. Corn is primary component of broiler's feed. Any countries having a higher competitiveness heavily depends on corn's domestic supply. This dependency against imported corn has definitely adverse effect for Indonesia since feed supply is decreasing due to competitive issue with food and fuel. This circumstance causes increasing feed price, whereas allocation for feed cost is the biggest, calculating around 60-70 percent of production cost [6,7]. The more increasing the feed price, the more improving the production cost of broiler. Proceeding statement becomes contradictory if applied, since Laws Number 18 of 2012 Article 36 section 1 stipulates that any import of husbandry feed shall only be implemented if domestic production of feed may not satisfy and/or it cannot be produced domestically.

Government regulation related to development of broiler industry was started in 1970 through Foreign Investment policy (PMA). Then, the development of broiler seeding from Japan and America was agreed. This policy was subsequently followed by cultivating policy in 1980, regulating limitation of business scale on broiler. The objective of such policy was to provide a wider work opportunity for people, as stipulated in Laws of Husbandry No 18 of 2009.

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Regency of Minahasa has 25 Districts, currently optimizing broiler cultivation. Such condition is in line with economic value of broiler as commodity, improving of chicken's meat production and consumption, and increasing growth of broiler population. Husbandry of broiler is still performed privately, and it is assumed that profit obtained by individual breeders has not been maximal since they have to allocate any cost on their own to obtain production factor, which its price is often fluctuate. Utilization of production factor relatively cheaper will result on efficiency and competitiveness [6]. Some previous researches have analyzed on competitiveness of some commodities, such as estate, food plant, profit, efficiency and feasibility and competitiveness of broiler by partnership design [8-12], yet there is no study concerning on competitiveness of broiler husbandry under private design in District of Tondano Utara, Regency of Minahasa. Therefore, this research aims to acknowledge the competitiveness of broiler husbandry in District of Tondano Utara, Regency of Minahasa, Indonesia utilizing comparative and competitive advantage approach.

## 2 Research method

### 2.1 Site and time of study

This research was performed on February–March 2020 in District of Tondano Utara, Regency of Minahasa, Province of North Sulawesi. The site of research was conducted purposively by consideration that such location was one of broiler production centers in Regency of Minahasa.

### 2.2 Sampling method, data collecting technique, and type of data

The research's sample was chosen by saturated sampling (census method). It means that sampling method is done if all members of population is used as sample [13]. Total of samples taken in this research was all breeders located in District of Tondano Utara, comprising of 68 breeders performing private business. Research data was obtained by survey with guided interview. Then, data obtained consisted of primary and secondary data. Primary data was data obtained directly from sample of breeders, comprising of respondent's identity, total and price of input, total and price of output, capacity of broiler purchasing/slaughtering, purchasing price of broiler, slaughtering and marketing cost, and selling price of broiler's meat (carcass). While, secondary data required was population of broiler, development of input and output price of broiler, development of Rupiah exchange currency, import and export price of broiler's input and output and incoming duty obtained by Service of Agriculture and Husbandry, husbandry company, Service of Commerce, Customs office, Bank Indonesia, PT Pelindo and so forth.

### 2.3 Data analysis

Data analysis technique utilized was PAM (Policy Analysis Matrix) method having been developed by Monke and Pearson [14]. Therefore, to know broiler's competitiveness in Regency of Minahasa, comparative and competitive advantages of PAM model were employed, as shown in the following Table 1.

**Table 1.** Construction of policy analysis matrix (PAM) model

Indicator	Revenue	Cost		Profit
		Tradable input	Domestic factor	
Private price	A	B	C	D
Social price	E	F	G	H
Divergence	I=A-E	J=B-F	K=C-G	L=D-H

Where,

A= Private revenue is production multiplied with market price (IDR)

B= Tradable input multiplied with market price (IDR)

C=Input of domestic factor multiplied with market price (IDR)

D= Private profit (A- B-C) (IDR)

E= Social revenue is production multiplied with social price (IDR)

F= Tradable input multiplied with social price (IDR)

G=Domestic input is multiplied with social price (IDR)

H = Social profit (E-F-G) (IDR)

Comparative advantage (Domestic Resource Cost Ratio) =  $G/(E-F)$   
 Competitive advantage (Privat Cost Ratio) =  $C/(A-B)$   
 Output transfer (OT);  $I = A-E$   
 Input transfer (IT);  $J = B-F$   
 Factor Transfer (FT);  $K = C-G$   
 Net policy transfer (NT);  $L = D-H$   
 Nominal Protection of Coefficient on Input (NPCI) =  $B/F$   
 Nominal Protection of Coefficient on Output (NPCO) =  $A/E$   
 Effective Protection Coefficient (EPC) =  $(A-B)/(E-F)$   
 Profitability Coefficient (PC) =  $D/H$   
 Subsidy Ratio to Producers(SIDR) =  $L/E$

### 3 Finding and discussion

Indicator of Policy Analysis Matrix (PAM) was based on data obtained from respondents (breeders). Such data consisted on breeder's revenue (output), production cost (tradable input and domestic factor), divided based on private price (actual) and social price (shadowed price). Output and input data in private price were inserted into the first row of PAM, while output and input data of social price were inserted in the second row of PAM. After two rows of PAM were filled up, private profit, social profit, output transfer, input transfer, and net transfer were gained. The analysis result of PAM can be seen in Table 2 below.

In detail, cell in the first row is cell A, breeder's revenue in one period of 35 days totally IDR 294,512,501. It was calculated based on selling price of broiler received by breeder from big trader/partner cooperated with breeder. Further, cell B is cost of tradable input (input traded in international market expensed as much as IDR 4,329,231 for every period of broiler. Cell C is non-tradable input (non-tradable domestic factor in international market) that had to be expensed by breeder to produce in one period (35 days) of broiler as much as IDR 183,720,819. Total of tradable and non-tradable input is total of input in producing within one period (35 days) of broiler in private price. As shown in table 2 the sum of input

**Table 2.** Policy analysis matrix of broiler farming/8000 broilers

Component	Revenue (IDR)	Tradable input (IDR)	Domestic factor IDR)	Profit (IDR)
Private Price	294,512,501	4,329,231	183,720,819	106,462,451
Social Price	192,801,861	2,286,780	183,720,819	6,794,262
Divergence	101,610,640	2,042,351	0	99,668,289

cost became deducing factor of breeders' revenue, so private profit of breeders (as shown in cell D) was IDR 106,462,451. Cell in the second row, which is cell E, is breeders' revenue in one period (35 days) of broiler based on selling price received in accordance with similar poultry price in global market, which was IDR 192,801,861. Cell F, which is tradable input expensed for one period (35 days) of broiler, was IDR 2,286,780. Cell G, a non-tradable input cost that must be expensed by breeders to produce in one period (35 days) of broiler, was IDR 183,720,819. Since there was no import performed for non-tradable input in cell G, cost shown in cell G was similar with cost depicted in cell C. Total of tradable and non-tradable input was total cost of input to produce in one period (35 days) of broiler under social price. Such total became deducing factor of breeders' revenue, so breeders' revenue in social price (as shown in cell H) was IDR 6,794,262. It is indicated that the use of policy analysis matrix, broiler farm in Tondano Utara District was profitable since social and privat profit on input and output of broiler farming were positive. The results of study were parallel with (14,15), by using policy analysis matrix, rice farm in India and meet processing in Borno State Nigeria was profitable since privat profit and social profit was positive and resources was efficiently utilized by farmers and processors.

#### 3.1 Analysis of competitive advantage

Competitive advantage possessed by broiler husbandry can be viewed based on value indicator of Private Profit (PP) and Private Cost Ratio (PCR). The value of PP and PCR in broiler husbandry is displayed in Table 3.

**Table 3.** Private profit and private cost ratio

Indicator	Value
Private profit (PP) (IDR)	106,462,451
Private cost ratio (PCR)	0.65

In Table 3, Private Profit had positive value of IDR 106,462,451, presenting that profit derived from operating broiler

husbandry. According to above detail, broiler husbandry in District of Tondano Utara is feasibly performed since it earns profit to breeders. While, Private Cost Ratio (PCR) is division between input cost of non-tradable private and input cost of tradable private. Husbandry business has competitive advantage if PCR value is less than ( $<$ ) 1. It means that profit earned by breeders is more than ( $>$ ) its input cost of non-tradable private. This in line with [15], the lesser the PCR value, the more competitive advantage the commodity. Based on Table 3, PCR value was 0.65, meaning that broiler husbandry performed by breeders had competitive advantage, where breeders were not only able to finance their domestic factor in private price, but also able to compete with broiler husbandries in other regions.

### 3.2 Analysis of comparative advantage

Comparative advantage can be employed to measure business efficiency of husbandry based on economic analysis. Indicator of comparative advantage on husbandry is measured from Social Profit (SP) and Domestic Resource Cost Ratio (DRCR) value. The value of SP and DRCR in broiler husbandry is clearly shown in Table 4.

**Table 4.** Social profit and domestic resource cost ratio in broiler farming

Indicator	Value
Social profit (SP) (IDR)	6,794,262
Domestic resource cost ratio (DRCR)	0.96

From Table 4 above, Social Profit had positive value, which was IDR 6,794,262. It, then, shows that broiler husbandry performed was economically profitable (social). The broiler business will still be profitable, even though there is no government policy regulating input or output, such as either subsidy or price protection and Rupiah exchange currency.

Further, domestic resource cost ratio (DRCR) is an indicator of ratio assessment between non-tradable input (domestic resource cost) against added value calculated within social price. A commodity has comparative advantage if DRCR value is less than ( $<$ ) 1. This means that profit obtained by breeders is greater than its input cost of non-tradable social. The lesser the value of DRCR, the greater the comparative advantage owned by broiler commodity and it is economically efficient.

Broiler husbandry in District of Tondano Utara had its DRCR value of 0.96, showing that such business had comparative advantage. In short, breeders were able to finance their domestic factor in social price and it had economically efficient. Though, there is no government intervention and subsidy, broiler husbandry has comparative competitiveness and can still survive in perfect market competition. The finding was accordance with [16] who declared broiler farm in Malaysia has DRCR value less the 1, means broiler industry was efficient.

### 3.3 Analysis of Government Policy against Input

Input policy indicates type of policy stipulated by government and its impact on broiler husbandry in District of Tondano Utara (as shown in Table 5). Input Transfer (IT) value in broiler showed positive value, which was IDR 2,042,351. This figure depicts that there was no government policy in tradable input, so breeders suffered from loss since they, privately, financed tradable input price in the domestic market which was larger than tradable input price in international market. Moreover, Nominal Protection Coefficient Input (NPCI) is ratio to measure IT. This ratio displays how wide is the gap between domestic price of tradable input price and social price. If NPCI is more than ( $>$ ) 1, it means that domestic input cost is higher than global input cost. In contrary, if NPCI is lesser than ( $<$ ) 1, it means that domestic input cost is lower than global input cost. From this research, NPCI value obtained was more than ( $>$ ) 1, which was 1.88. Even though there was no government intervention, the finding of this research showed that NPCI value was 1.88. Thus, government is able to rise tradable input price in domestic market. The findings was paralle with [17] who mentioned that domestic input price of broiler was higher than global input cost eventhough there was no government intervention.

**Table 5.** Indicator of government policy in broiler farming

Indicator	Value
Input transfer (IT) (IDR)	2,042,351
Nominal protection coefficient on input (NPCI)	1.88
Transfer factor (TF)	0

Divergence can influence non-tradable input price, so it causes non-tradable private price is different from its social price, and it results on Transfer Factor (TF). In addition, divergence value of non-tradable price can be positive (taxes or resource transfer from husbandry system are applied) or negative (subsidy or resource transfer into husbandry system are applied). In this research, Transfer Factor of broiler husbandry was 0 (zero), meaning that there was no government policy in non-tradable input used by breeders. It can be seen that private price of non-tradable input paid by breeders was similar with its social price.

### 3.4 Analysis of government policy against output

Policy against output was analyzed with Output Transfer (OT) and Nominal Protection Coefficient on Output (NPCO). Below, Table 6 demonstrates that Transfer Output (OT) value was positive, indicating that there was subsidy or resource transfer supplementing profit of farming system. While, OT value was negative presenting that there was tax or resource transfer deducting profit of husbandry system. In domestic market, output price of broiler was lower than output price in international market, viewed from Output Transfer value shown in the Table 6 which was IDR 101,610,640. This means that private revenue of breeders was higher than determined revenue if market was not distorted by output price of broiler, since there was Output Transfer from producer to consumers, which was IDR 101,610,640.

**Table 6.** Indicator of Government policy against output of broiler farming

Indicator	Value
Transfer output (OT) (IDR)	101,610,640
Nominal protection coefficient on output (NPCO)	1.53

Nominal Protection Coefficient on Output (NPCO) is ratio to measure Output Transfer (OT). This ratio shows how wide is the gap between private price and social price. If NPCO is larger than ( $>$ ) 1, it means that domestic price is higher than import or export price, and farming system receives protection. Contrastingly, if NPCO is smaller than ( $<$ ) 1, domestic output price is smaller than global price. It depicts that domestic price is unprotected. Based on Table 6, Nominal Protection Coefficient on Output (NPCO) of broiler farm was larger than ( $>$ ) 1, which was 1.53. It states that domestic output price was higher than output of social price. Thus, breeders should obtain incentive from government to improve or maximize their husbandry. This study was in line with [17] who stated that coefficients of protection of broiler in Johor was more than one.

### 3.5 Analysis of government policy against input – output

Analysis of input-output policy was utilized to analyze government policy against both input and output. This policy was analyzed with value of Effective Protection Coefficient (EPC), Net Transfer (NT), Profitability Coefficient (PC) and Subsidy Ratio to Producers (SIDR). Those indicators are showed in following Table 7.

**Table 7.** Indicator of government policy against input –output on broiler farming

Indicator	Value
Effective protection coefficient (EPC)	1.53
Net transfer (NT) (IDR)	99,668,289
Profitability coefficient (PC)	15.67
Subsidy ratio to producers (SRP)	0.52

The level of Effective Protection (EPC) is ratio comparing added value in the level of domestic price and in the global price. Hence, the objective of EPC is to show some impacts of joint transfer resulted by a policy, either transfer of tradable output or tradable input. If EPC value is more than ( $>$ ) 1, meaning that policy against output price or subsidy against input price has beneficial purpose for breeders to continuously develop their broiler husbandry. In contrary, if EPC value is less than ( $<$ ) 1, stating that government policy hampers breeders to produce. Based on Table 7, broiler farming in District of Tondano Utara had Effective Protection Coefficient, which was more than ( $>$ ) 1 (1.53). This means that current policy has beneficial impact for breeders. However, at the time of the research, there was no policy stipulated in District of Tondano Utara related to broiler husbandry. Based on analysis, the value was 1.52, which was more than ( $>$ ) 1. It was profitable for breeders, though no government policy was applied. The relation with EPC discussion is that any condition without any policy currently applied is profitable, but breeders are safer if there is policy applied. Net Transfer (NT) is sum up of all transfer effects, either positive or negative, and revenue or cost. Based on profitability identity, Net Transfer is sum up of OT, IT and FT, while divergence identity, NT is a difference between private and social profit. Positive value of NT demonstrates that there is surplus addition from producers, but, contrastingly, negative value of NT depicts decreasing profit of breeders due to application of government policy. Based on Table 7, Net Transfer value was positive, which was IDR 99,668,189. This presents that there was economic incentive to improve broiler production. It was seen from profit obtained by breeder when government policy applied was higher than loss, where there was no government policy. Profitability Coefficient (PC) aims to measure effect from all transfers against private profit. This coefficient is similar with ratio between private profit and social profit calculated with similar data by NT calculation. PC value is less than ( $<$ ) 1, meaning that profit's revenue is lower than determined profit obtained in social price. In contrast, PC value is more than ( $>$ ) 1, depicting that breeders' profit is higher than profit in social price. Profitability Coefficient (PC) value in broiler husbandry was 15.67, meaning that profit received by breeders was higher than determined profit obtained in social price. Without

government policy applied, breeders' profit is higher than expected profit obtained by breeders (based on social price). Subsidy Ratio to Producers (SRP) is ratio used to measure all transfer impacts. This ratio shows how much revenue of increasing or decreasing system due to transfer influence. Negative value of SRP displays that government policy applied results breeders to expense production cost against input, which is higher than its balancing cost. Conversely, positive value of SRP depicts that government policy applied causes breeders expensing lower production cost against input. From above Table 6, broiler husbandry had positive value of SRP, which was 0.52. This result is different from other researches regarding on corn agriculture where farmers had to pay higher input cost than global price [21], resulting on negative value of SRP. Overall, there are 2 impacts due to application of government policy. This application concerns on subsidy against tradable and non-tradable input, beneficially profitable for breeders since it reduces production cost. The latter policy is distortion of output price giving adverse effect for breeders since it reduces breeders' profit. This study were in line with [16-20] but different with [21,22], government policy on input and output of broiler farm was in positive value means that current policy has beneficial impact for breeders. Although there was no policy stipulated in research area but breeders were able to compete with broiler farming in other regions since they able to finance domestic factors in social price.

## 4 Conclusion

Based on the findings of the study conducted, it has been proven that broiler husbandry in District of Tondano Utara had competitiveness since Private Cost Ratio (PCR) value was less than (<) 1, which was 0.65. It means that husbandry system of broiler cultivated by breeders had competitive advantage, having ability to finance its domestic factor in private price and breeders were able to compete with broiler husbandry in other regions. Beside its competitive advantage, Domestic Resources Cost Ratio (DRCR) value of broiler farm in District of Tondano Utara was less than (<) 1, which was 0.96. It postulates that broiler husbandry cultivated by breeders had comparative advantage, since breeders were able to finance domestic factor in social price and it was economically efficient.

So It is recommended to encourage market expansion to the export market through the development of broiler chicken meat processing industry in North Sulawesi Province, Indonesia

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**LETTER OF ACCEPTANCE (LOA) FOR  
FULL PAPER TO BE PRESENTED ON  
ICONARD**

Dear Erwin Wantasen

On behalf of the Committee of the International Conference on Agribusiness and Rural Development 2020, we are pleased to confirm that **FULL PAPER** of the following manuscript:

Title : The Competitiveness of Broiler in District of Tondano  
Utara, Regency of Minahasa, Province of North Sulawesi-  
Indonesia  
Affiliation (presenter) : Fakultas Peternakan Universitas Sam Ratulangi

**has been accepted to be presented on** the International Conference on Agribusiness and Rural Development 2020 that will be held virtually on 13-14 October 2020. We greatly appreciate your interest to join our conference. Please pay attention for below matters:

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Your good cooperation and fast response on revising the manuscript will be very much appreciated, so we can publish the proceeding by the schedule (indexed by Scopus).

Yogyakarta, Indonesia, 18 September 2020

Chairman



Zuhud Rozaki, PhD.

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